SERVICE MANUAL

STEREO RECEIVER

SX-939

KCU, F, GN

NOTE:

MODEL SX-939 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Round label on rear panel	Voltage	Type
KCU	120V only	UL (U.S.A.) and CSA (Canada) approved.
F	110V, 120V, 130V 220V and 240V (switchable)	
GN	220V only	General export model SEMCO (Sweden), NEMCO (Norway) and DEMCO (Denmark) approved.

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CONTENTS

About 220V only model labeled "GN"

This model whose rear panel is labeled "GN" circular mark operates only on 220V, substantially in its circuit design from two other models. When repairing this model, please see the manual on page 71 and the followings which include such items as Circuit connection diagram, Miscellaneous parts list, Schematic diagram of power supply circuit assembly, P.C. board pattern and its parts list.
Before servicing, also please do not fail to check to see if the "GN" mark is labeled on the rear panel.

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1. SPECIFICATIONS

SEMICONDUCTORS

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ICs 4
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AMPLIFIER SECTION

Continuous Power Output
20Hz~20kHz
(Both channels driven) ..... 70W + 70W (8Ω), 80W + 80W (4Ω)
1kHz (Both channels driven) ..... 75W + 75W (8Ω), 100W + 100W (4Ω)
Harmonic Distortion
(20Hz~20kHz Continuous
Power Output) ..... Less than 0.3%
(1W + 1W, Power Output) ..... Less than 0.05%
Intermodulation Distortion
(Continuous Power Output) ..... Less than 0.3%
(1W + 1W, Power Output)..... Less than 0.05%
Power Bandwidth
(IHF, Both channels driven) ..... 5Hz~40kHz (T.H.D. 0.3%)
Frequency Response ..... 7Hz~100kHz
Input Sensitivity/Impedance
POWER AMP IN 1V/50kΩ
Output
Speaker ..... A, B, C, A + B, A + C, B + C (4Ω~16Ω)
Headphone ..... 4Ω~16Ω
Damping Factor
(1kHz, 8Ω) ..... More than 45
Hum & Noise
(IHF, short-circuited,
A Network) ..... More than 110dB
Residual Hum & Noise
(8Ω, Pre & Power amplifier)..... Less than 1mV

PREAMPLIFIER SECTION

Input Sensitivity/Impedance
PHONO 1 ..... 2.5mV/50kΩ
PHONO 2 ..... 2.5mV/50kΩ
PHONO Overload Level
(rms/p-p) 250mV/700mV
MIC 2.0mV/50kΩ
AUX..... 150mV/70kΩ
TAPE PB 1, 2..... 150mV/70kΩ
TAPE PB 2 (DIN connector)..... 150mV/70kΩ
Output Level/Impedance
TAPE REC 1, 2 ..... 150mV
TAPE REC 2 (DIN connector) 30mV/80kΩ
PRE OUT 1V/1kΩ
Harmonic Distortion
(20Hz~20kHz) ..... Less than 0.1%

Frequency Response
- PHONO (RIAA equalization) ..... 30Hz~15kHz±0.3dB
- AUX, TAPE PB ..... 10Hz~40kHz $^{+0}_{-1}$ dB

Tone Control
- BASS:
- MAIN ..... ±10dB (100Hz)
- SUB ..... ±5dB (50Hz)
- TREBLE:
- MAIN ..... ±10dB (10kHz)
- SUB ..... ±5dB (20kHz)

Filter
- LOW Cut ..... −8dB (50Hz) 6dB/oct.
- HIGH Cut ..... −9dB (10kHz) 6dB/oct.

Loudness Contour
(Volume control set at −40dB position) ..... +8dB (100Hz), +4dB (10kHz)

Hum & Noise
(IHF, short-circuited, A Network)
- PHONO ..... More than 70dB
- MIC ..... More than 65dB
- AUX, TAPE PB ..... More than 95dB

Muting ..... −20dB

FM SECTION

Usable Sensitivity (IHF) 1.8μV
Capture Ratio (IHF) 1.0dB
Selectivity (IHF) 80dB
Signal-to-Noise Ratio 70dB
Image Rejection (98MHz) 85dB
IF Rejection (98MHz) 100dB
Spurious Rejection 100dB
AM Suppression 55dB
Harmonic Distortion:
- MONO ..... Less than 0.2%
- STEREO ..... Less than 0.4%

Frequency Response ..... 20Hz~15kHz $^{+0.2}_{-2.0}$ dB
50Hz~10kHz $^{+0.2}_{-0.5}$ dB

Stereo Separation:
- 1kHz ..... More than 40dB
- 50Hz~10kHz ..... More than 30dB

Sub Carrier Suppression 65dB
Antenna Input ..... 300Ω Balanced, 75Ω Unbalanced
Muting ..... ON−OFF

AM SECTION

Sensitivity
- (IHF, Ferrite antenna) 300μV/m
- (IHF, Ext. antenna) 15μV

Selectivity 40dB
Signal-to-Noise Ratio 50dB
Image Rejection 65dB
IF Rejection 85dB

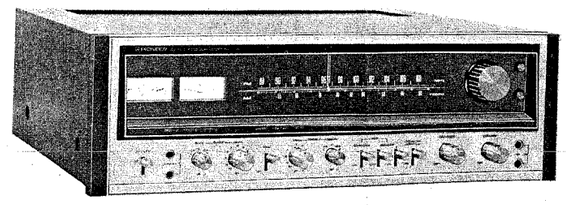
MISCELLANEOUS

Power Requirements ..... AC 120V 60Hz or 110, 120, 130, 220 and 240V (switchable) 50/60Hz
Power Consumption ..... 290W (UL approved model only)
470W (5 line voltage model only)
Dimensions ..... 520 (W) x 175 (H) x 420 (D) mm
20-1/2 x 6-7/8 x 16-9/16 in.
Weight:
- Without Package ..... 18.5 kg (40 lb 11 oz)
- With Package ..... 22.6 kg (49 lb 12 oz)

FURNISHED PARTS

FM T-type Antenna 1
Operating Instructions 1
Fuse 6A 1
Fuse 3A ..... 1 } (5 line voltage model only)

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.



2. FRONT PANEL FACILITIES

FRONT PANEL FACILITIES

SPEAKER BUTTONS

Each of speaker systems A, B, and C is connected to each of output terminals A, B, and C.
By pushing the following:

SPKR-A .... Speaker systems A into operation
SPKR-B .... Speaker systems B into operation
SPKR-C .... Speaker systems C into operation

NOTES:

1. *When any two pairs of the buttons (A + B, B + C, C + A) are depressed, the corresponding pairs of speaker systems will come into operation. However, operating all three buttons even though depressed at the same time is not possible.*
2. *Only when listening through headphones, press again the SPKR button(s) in use to OFF (undepressed) from the ON position (pressed)*

POWER SWITCH

Turn this switch ON but wait for some 3 to 6 seconds, during the silence of which the protection circuit eliminates the unpleasant noise not imputed to a receiver fault.

PHONES (1, 2) OUTPUT JACKS

Accept two pairs of headphones.

BASS CONTROLS

Adjust bass tone quality.

100Hz ..... For the low frequencies below 400Hz. Possible up to 10dB of increasing or reducing at 100Hz in 2dB steps.

50Hz ..... After adjustment by the 100Hz control, further adjust frequencies below 80Hz by this control, if necessary. Possible up to 5dB of increasing or reducing in bass response at 50Hz in 2.5dB steps.

LOW CUT, HIGH CUT BUTTONS

LOW ..... When the low-pitched rumble (turntable motor or other source) is obtrusive, depress the LOW CUT button to ON. In no interference, leave it undepressed (OFF).

HIGH ..... When the high frequency scratch noise (records or other source) is much, depress this button to ON. In no interference, leave it undepressed (OFF).

TONE SWITCH

When in the ON (up) position, this switch causes the amplifier section to operate with a flat frequency regardless of the tone control settings. Use this switch to check the audio characteristics of your listening room such as when it is necessary to check the tone quality of phono cartridges and speakers and also to particularly set the tone controls to be assessed.

SIGNAL METER

For AM and FM station tuning.

AM tuning: Tune the dial pointer so that the SIGNAL meter needle comes to the extreme right.

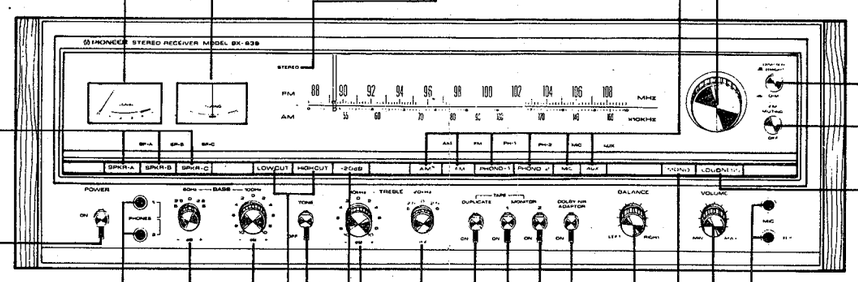
FM tuning: Both the SIGNAL and FM TUNING meters work together. The optimum point of the SIGNAL meter needle is the same as in AM tuning. Then use the FM TUNING meter.

FM TUNING METER

While getting the SIGNAL meter needle going to the right, make fine adjustment with the FM TUNING meter whose needle comes to the center (indicating the optimum reception).

FM STEREO INDICATOR

TUNING KNOB



TREBLE CONTROLS

Adjust treble tone quality.

10KHz ..... For the high frequencies above 2.5kHz. Possible up to 10dB of increasing or reducing in treble response at 10KHz in 2dB steps.

20KHz ..... After adjustment by the 10kHz control, further adjust frequencies above 12kHz by this control, if necessary. Possible up to 5dB of increasing or reducing in treble response at 20kHz in 2.5dB steps.

AUDIO MUTING BUTTON –20dB

Depress this button to mute the audio input to –20dB. No need to turn down the VOLUME control on each occasion for your convenience.

TAPE DUPLICATE SWITCH

Leave this switch in the ON (down) position to duplicate or edit a recorded tape using two tape decks. For normal use, switch over to the OFF (up) position.

BALANCE CONTROL

Adjusts the balance between the sound volume from the left and right speaker systems.

TAPE MONITOR (1, 2) SWITCHES

Monitor the recorded sound while recording with a tape deck. Also possible to play back tapes as follows:

1 ..... With a tape deck connected to the TAPE 1 jacks (REC and PB), either monitoring of recording in progress or playing back is possible.

2 ..... With a tape deck connected to the TAPE 2 jacks (REC and PB or REC/PB connector), the same as in 1 above is possible.

DOLBY NR ADAPTOR SWITCH

When employing Dolby Noise Reduction Adaptor depress this DOLBY NR ADAPTOR to ON.

FUNCTION SELECTOR BUTTONS

For selecting the program source, push each button as follows:

AM ..... For AM broadcast reception.

FM ..... For FM broadcast reception. The STEREO indicator lights up when the broadcast is in stereo.

PHONO 1 ... For operating a turntable connected to the PHONO 1 input jacks.

PHONO 2 ... For operating a turntable connected to the PHONO 2 input jacks.

MIC ..... For using a microphone. Not possible to mix with other program source.

AUX ..... For listening to audio equipment (cartridge tape player, TV sound tuner, etc.) connected to the AUX input jacks.

DIMMER SWITCH

Dims the brightness of the indicator light. Press again to restore full brightness.

FM MUTING BUTTON

Leave this button undepressed (in the ON position) while tuning in FM stations. Inter-station noise may interfere with FM reception while tuning between stations. To suppress this noise, leave the MUTING button undepressed (in the ON position). If the low signal strength is due to distance from the transmitter or other influences, depress this button, at which the weak station will be heard with the MUTING "OFF."

LOUDNESS BUTTON

Depress this button to listen at low volume. The human ear's frequency response varies according to the listening volume. The depressed button compensates for hearing response with emphasis on the bass and treble.

MIC INPUT JACKS

L, R ..... For connecting the left and right channel microphones.

NOTE:
Use the high impedance (above 20kΩ) with 6mm diam. phone plugs.

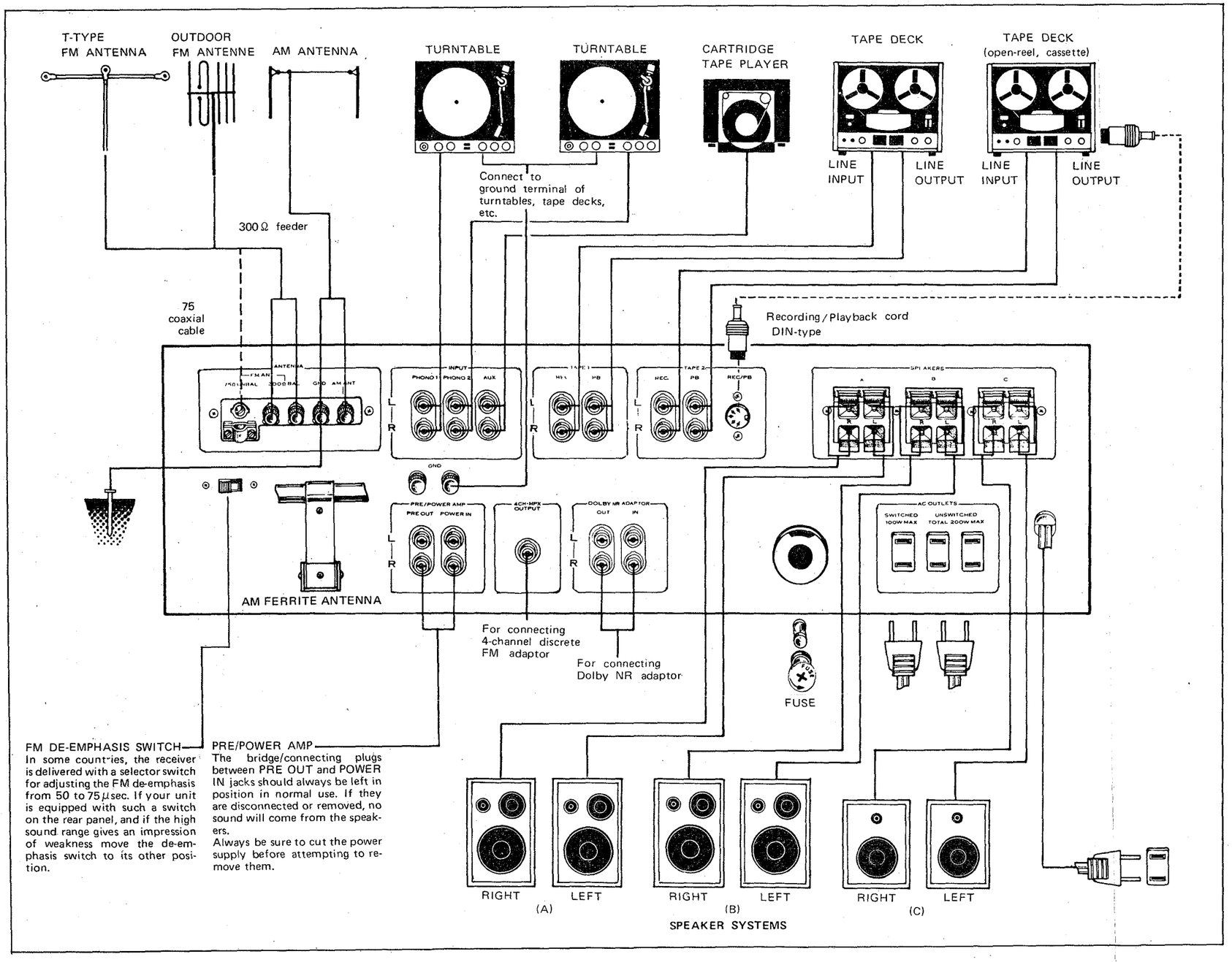
VOLUME CONTROL

Governs both the volume of sound outputs from the speaker systems and from the headphones.

MODE BUTTON

Leave this button undepressed (if necessary, depress this to release it when already depressed) for STEREO playback. For MONO playback, depress it. In this case stereo signals for left and right channels will be mixed into mono signal which will be heard from the center of both speaker systems.

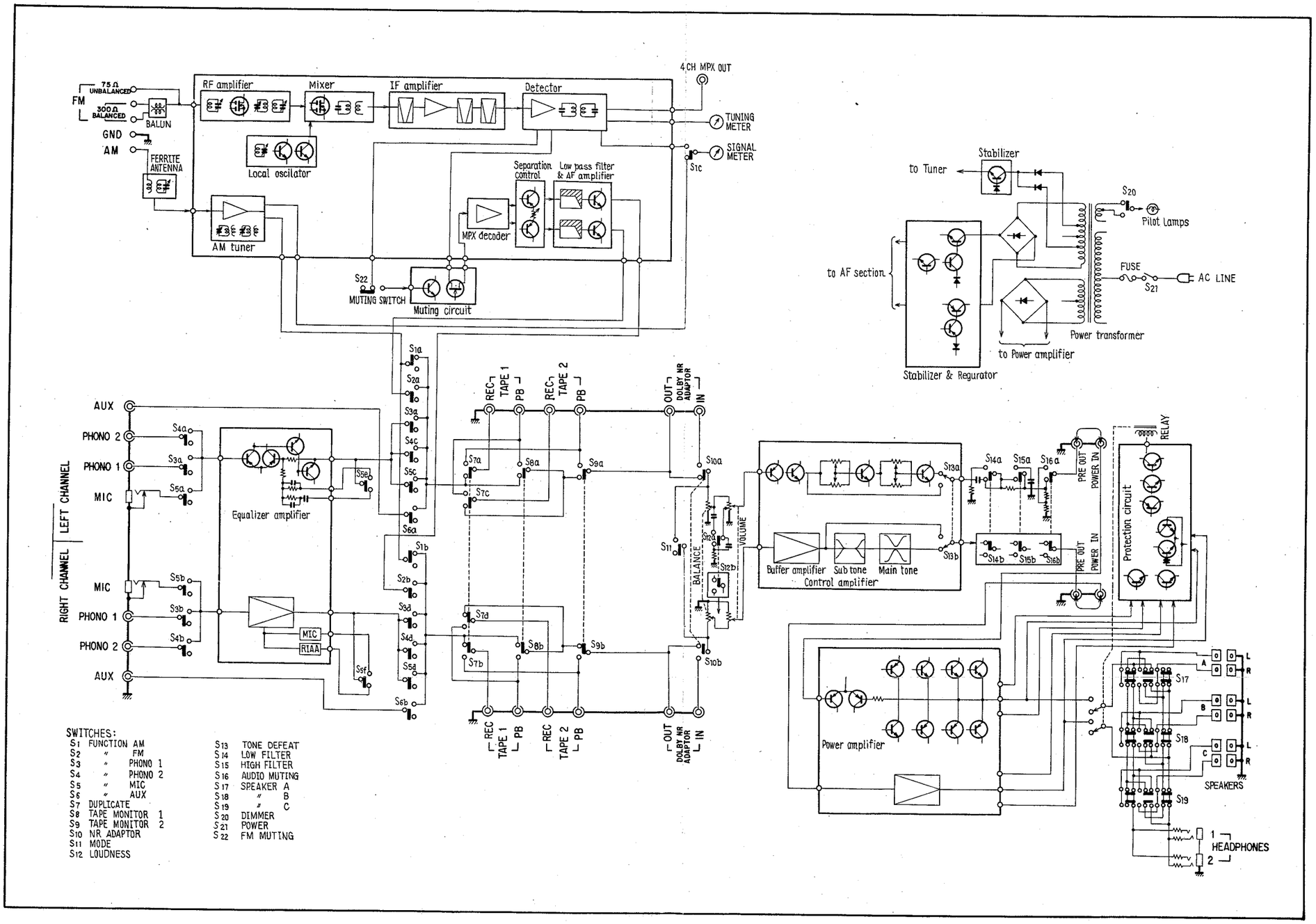
3. CONNECTION DIAGRAM



FM DE-EMPHASIS SWITCH
In some countries, the receiver is delivered with a selector switch for adjusting the FM de-emphasis from 50 to 75 μsec. If your unit is equipped with such a switch on the rear panel, and if the high sound range gives an impression of weakness move the de-emphasis switch to its other position.

PRE/POWER AMP
The bridge/connecting plugs between PRE OUT and POWER IN jacks should always be left in position in normal use. If they are disconnected or removed, no sound will come from the speakers.
Always be sure to cut the power supply before attempting to remove them.

4. BLOCK DIAGRAM



SWITCHES:

S1	FUNCTION AM	S13	TONE DEFEAT
S2	〃 FM	S14	LOW FILTER
S3	〃 PHONO 1	S15	HIGH FILTER
S4	〃 PHONO 2	S16	AUDIO MUTING
S5	〃 MIC	S17	SPEAKER A
S6	〃 AUX	S18	〃 B
S7	DUPLICATE	S19	〃 C
S8	TAPE MONITOR 1	S20	DIMMER
S9	TAPE MONITOR 2	S21	POWER
S10	NR ADAPTOR	S22	FM MUTING
S11	MODE		
S12	LOUDNESS		

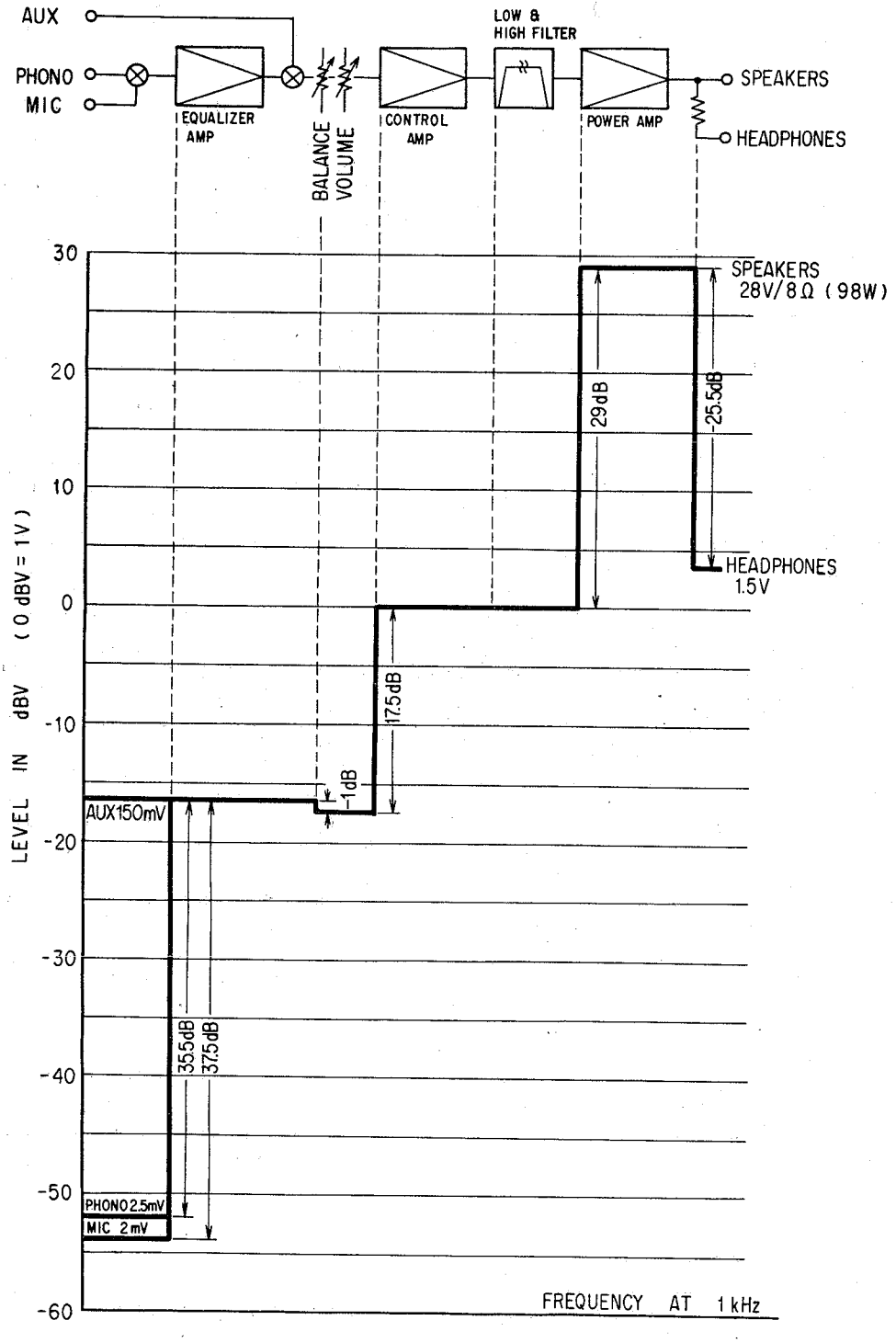
5. CIRCUIT DESCRIPTION

SIGNAL PATH

1. The FM broadcast signal waveform from the antenna is fed to the two dual-gate MOS field-effect transistor in the front end section for radio frequency amplification. This signal is converted into an intermediate frequency by the dual-gate MOS FET mixer stage in combination with the signal from the local oscillator.
2. The intermediate frequency signal, converted within the front end section, is fed to three ceramic filters and two ICs, where it is tuned, amplified, and detected, becoming a audio frequency (composite) signal.
   The composite signal following detection is fed to the 4 CH MPX terminal jack and the multiplex decoder stage.
3. The multiplex decoder stage uses one IC for three functions: to demodulate the composite signal into the left and right channel stereo signals, to operate the automatic mode switching between stereo/mono, and to switch the stereo indicator lamp appropriately.
   The decoding system uses a phase locked loop (PLL) circuit, which assures continuous stable operation and excellent stereo separation with low susceptibility to external noise (such as car ignition noise) and ambient temperature changes.
   After decoding, the signal is fed to four transistors and one LC filter, where the residual carrier component (38kHz, 19kHz, and SCA) is rejected, and then to the audio amplifier section.
4. The FM muting circuit consists effectively of two circuits, designed to reduce the pulse noise which can so easily arise when a muting circuit is operative.
   The one circuit is an electronic switch incorporated into the IC, so that the demodulated circuit is switched off and on in the IC, and the other gate circuit the composite signal by means of an FET.
5. The AM tuner section employs one monolithic IC which functions as radio frequency amplifier, frequency converter, local oscillator, intermediate frequency amplifier, and detector. The output is a pure audio signal.
6. The signals which are applied to the MIC and PHONO terminal jacks are selected by the FUNCTION switch before being fed to the first stage of the three-stage differential direct-coupled equalizer amplifier by which the signals are amplified.
   In order to reduce the switch noise, the circuit configuration employed enables the potential at the input and output terminals to be set at near zero volts.
   It incorporates an independent differential circuit in the first stage of the equalizer amplifier whose DC supply uses twin plus and minus.
7. The output from the equalizer amplifier, together with that from the AUX terminal jacks, the audio signal from the AM tuner, and the audio signal from the FM tuner, are all selected by the FUNCTION switch, and pass through the switch circuit for TAPE DUPLICATE, TAPE MONITOR, DOLBY NR ADAPTOR, and the circuits for BALANCE and VOLUME controls, before being fed to the control amplifier.
8. The control amplifier has an extremely high input impedance, using PNP and NPN transistors in a two-stage direct-coupled circuit. This greatly reduces the influence of the performance inherent in equipment connected externally.
   The output from this two-stage direct-coupled circuit is divided into two circuit systems.
   One goes to the TONE switch via the twin tone control circuit, and the other goes directly and unmodified in any way to the TONE switch. The TONE switch selects between them.
9. The amplifier section of the twin control has closed loop NFB amplifiers for both the main and sub circuits, each of which has its own transistor, eliminating mutual interference.
10. The control amplifier output is fed to the power amplifier after passing through the LOW FILTER, HIGH FILTER, and AUDIO MUTING circuits.
    The first stage of the power amplifier is a differential amplifier element, and the second stage uses a constant current load circuit, so that DC potential drift is prevented.
    On the other hand, the final output stage uses two power transistors in parallel in both the upper and lower circuits, so that large collector dissipation is possible.
11. The power amplifier output is fed to the three push buttons which form the SPEAKER switch. This selects A, B, and C speaker system terminal connection.
    If all three speaker systems were to be connected simultaneously, the effective speaker impedance might be less than 4Ω. To guard against this possibility, when all three buttons are depressed together, all three systems are disconnected from the amplifier.
12. The protection circuit which guards against DC potentials at the power amplifier output junctions, against speaker complex load im-

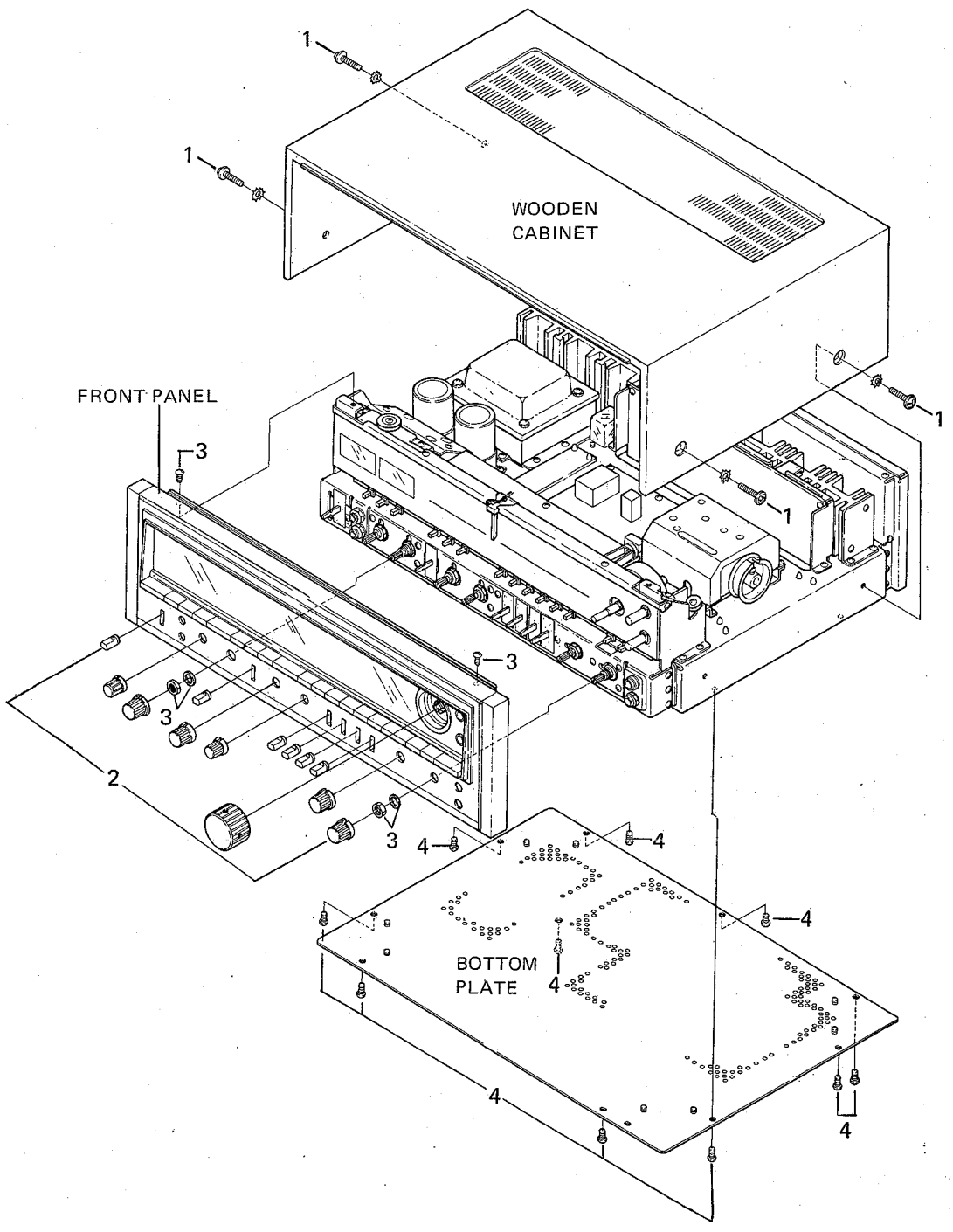
pedances less than 4Ω, and shorts across the speaker terminals. Their operation is such that, under the corresponding abnormal condition, a relay acts to separate the output junction and the output circuit. Further, this protection circuit also helps to mute the unwanted signal which immediately follows switching the POWER switch ON, and to immediately disconnect the output after switched OFF.

6. LEVEL DIAGRAM



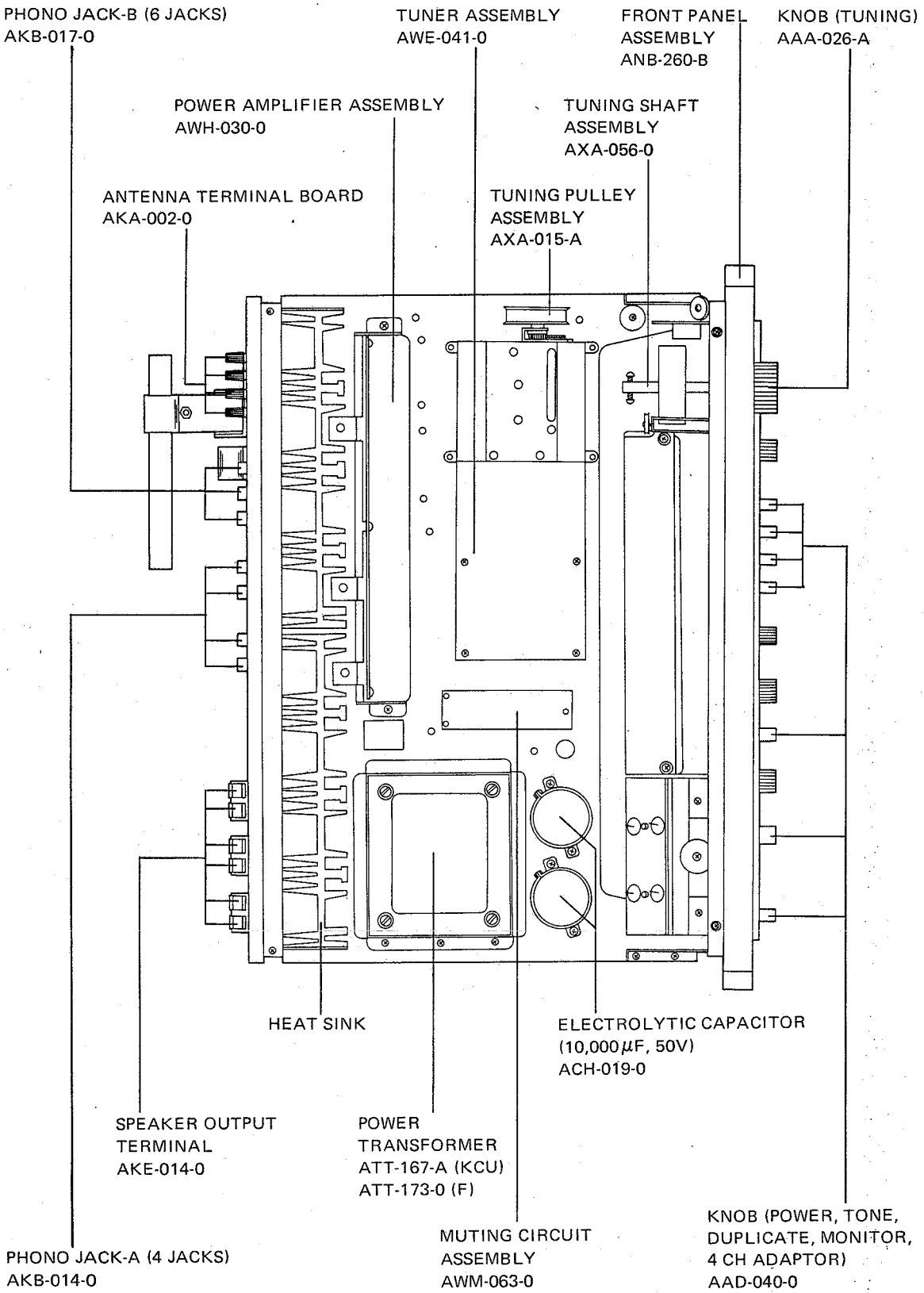
7. DISASSEMBLY

1. To remove the wooden cabinet, first remove the two screws holding each side, then lift the back of the wooden cabinet upward.
2. Pull off all knobs.
3. Remove the two screws in the upper edge of the front panel and remove two nuts and washers. Then pull the panel gently forward.
4. To remove the bottom plate, first remove the ten screws holding it in place.

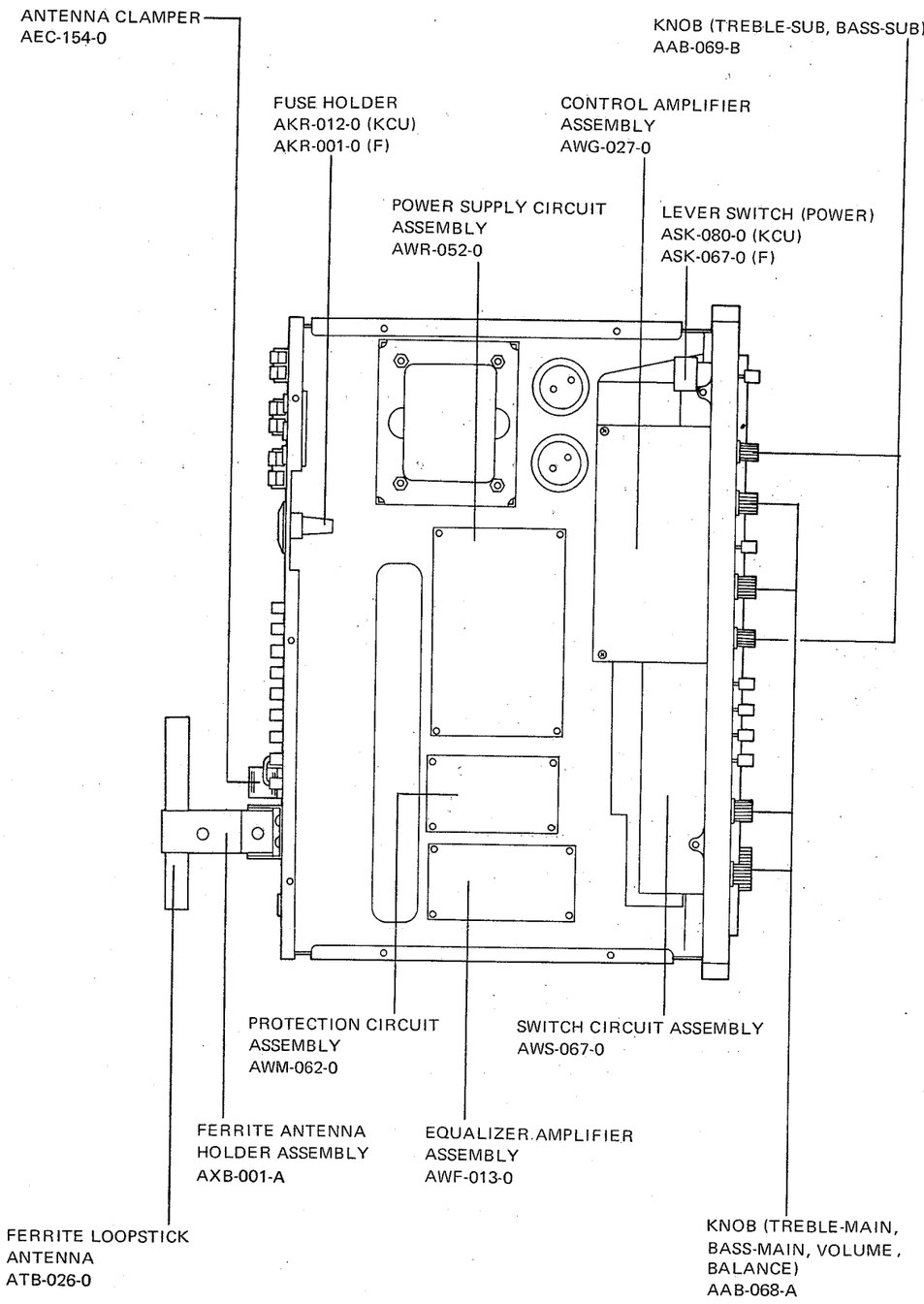


8. PARTS AND P.C. BOARD LOCATIONS

TOP VIEW

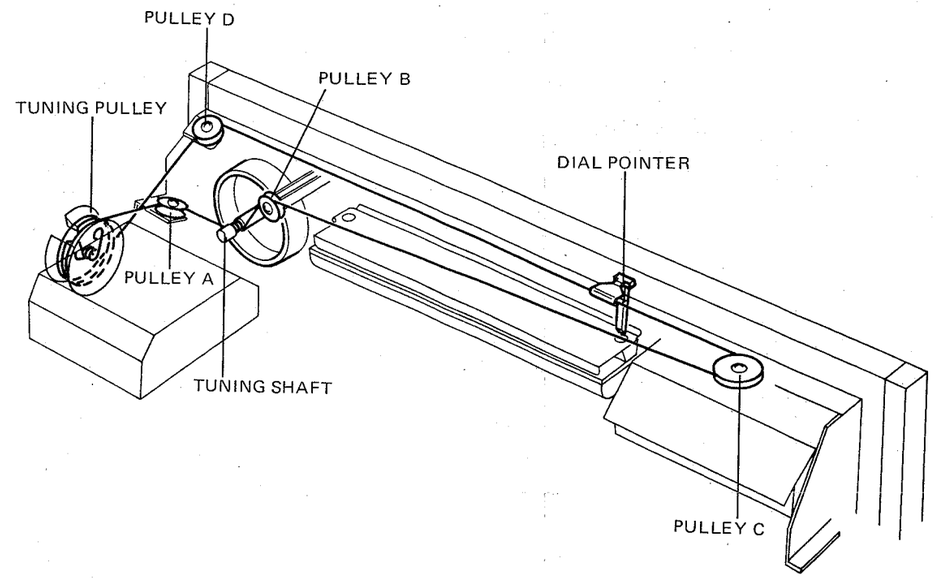


BOTTOM VIEW



9. DIAL CORD STRINGING

1. Turn the tuning capacitor so that its plates protrude as much as possible.
2. Tie one end of the string to the spring on the TUNING pulley (attached to the tuning capacitor).
3. Lead the string around pulley A, then wind it three turns around the TUNING shaft.
4. Lead the string around pulleys B, C and D, then wind it 1-1/2 turns around the TUNING pulley.
5. Now tie the other end of the string to the spring on the TUNING pulley. Turn the TUNING shaft and check for proper function. Then trim the ends of the string.
6. Turn the TUNING shaft until the plates of the variable are all the way in. Move the pointer to the left-end starting point on the dial and fasten it to the string in that position.

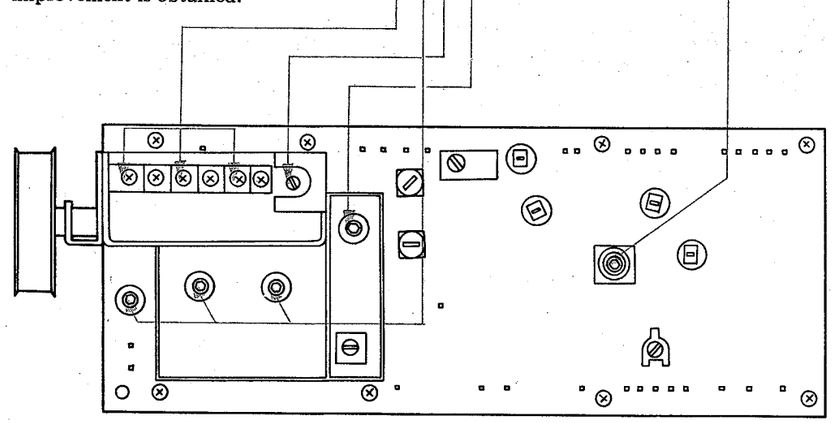


10. ALIGNMENT PROCEDURE

10.1 ENGLISH

ALIGNING THE FM SECTION

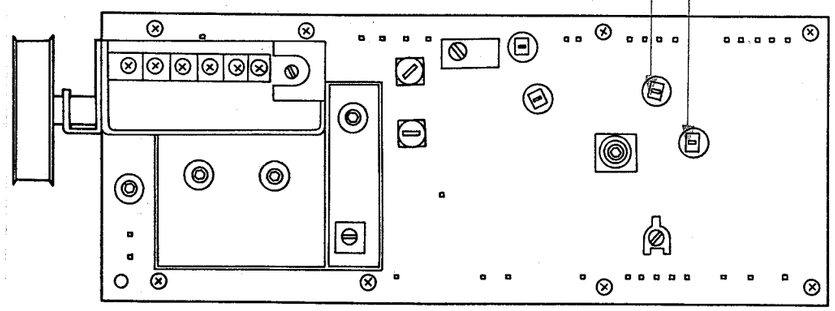
1. SX-939 Control Settings
   Set the controls (knob and switches) of the SX-939 as follows:
   POWER: ON
   FUCTION: FM
   FM MUTING: OFF
2. Connections between Test Equipment and the SX-939
   - The output from an FM signal generator should be connected to the 300Ω antenna terminals of the SX-939.
   - A distortion meter should be connected to the TAPE REC terminal jacks on the SX-939.
   - An AC millivolt meter should be connected to the TAPE REC terminal jacks on the SX-939 in parallel with the distortion meter.
3. Set both the FM signal generator and the SX-939 to indicate 98MHz.
4. Turn the FM signal generator output level down to minimum.
5. Turn the lower core and adjust so that the TUNING meter needle is centered.
6. Increase the FM signal generator output to 60dB, modulated at 400Hz, with a deviation of ±75 kHz.
7. Turn the upper core and adjust so that the distortion is at a minimum.
   Steps 4 ~ 7 above should be repeated several times in succession, until no significant improvement is obtained.
8. Set the FM signal generator output level to 10dB, modulated at 400Hz, with a frequency deviation of ±75 kHz.
9. Adjust for maximum output at 90MHz.
10. Adjust for maximum output at 106MHz.
11. Adjust for maximum output at 90MHz.
12. Adjust for maximum output at 106MHz.
    Steps 11 ~ 12 above should be repeated several times in succession, until no further significant improvement is obtained.



ALIGNING THE FM MPX SECTION

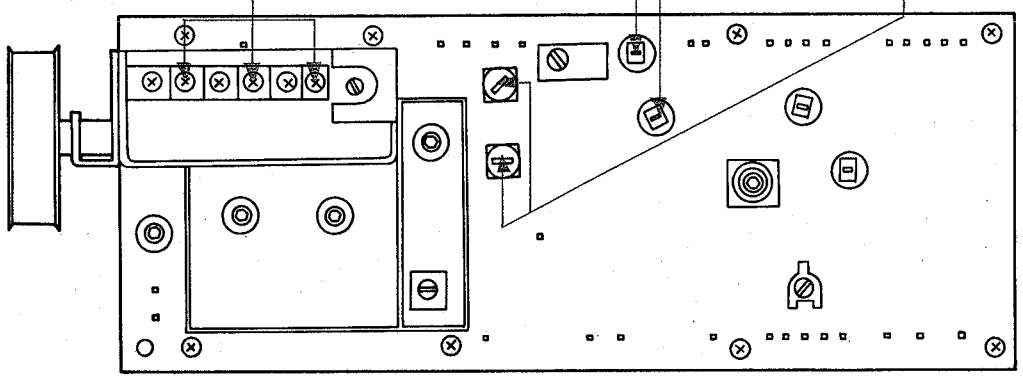
Notes: This set of adjustments should not be carried out until the alignment of the FM section (1 ~ 12 above) has been completed.
The multiplex signal generator should be connected to the external modulator terminals of the FM signal generator.

1. SX-939 Control Settings
   Set the controls (knob and switch) of the SX-939 as follows:
   POWER: ON
   FUNCTION: FM
   FM MUTING: OFF
2. Connections between the Test Equipment and the SX-939
   - The output from the FM signal generator should be connected to the 300Ω antenna terminals of the SX-939.
   - The output from the MPX signal generator should be connected to the external modulator terminals of the FM signal generator.
   - The oscilloscope X plates (horizontal inputs) should be connected to the PILOT OUT terminals on the MPX signal generator, and the Y plates (vertical inputs) to terminal number 18.
   - The AC millivolt meter should be connected to the TAPE REC terminals (with changeover possible from L to R channels).
3. Multiplex Signal Generator Modulation
   L + R (1kHz): 67.5kHz deviation
   PILOT (19kHz): 7.5kHz deviation
4. Set the FM signal generator output to minimum.
5. Adjust for a stationary Lissajous waveform on the oscilloscope.
6. Reset the FM signal generator to 60dB level output, and modulate either the L or R channel.
7. Adjust for the maximum separation.



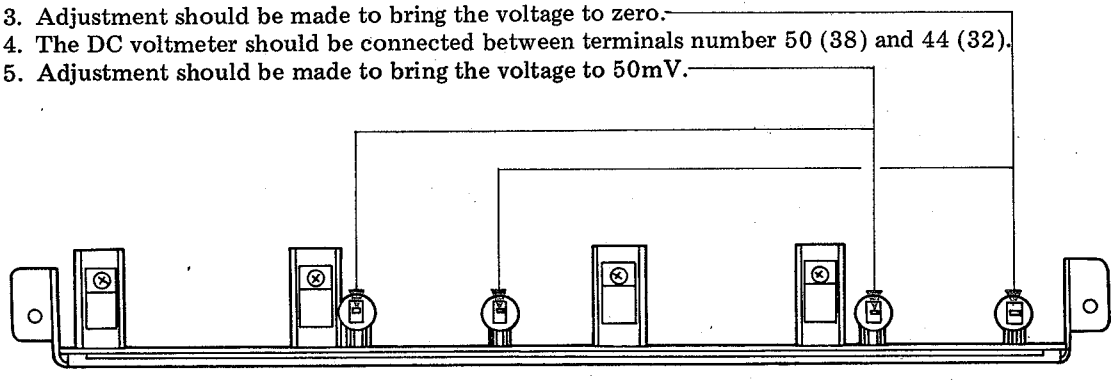
ALIGNING THE AM SECTION

1. SX-939 Control Settings
   Set the controls (knob and switch) of the SX-939 as follows:
   POWER: ON
   FUNCTION: AM
2. Connections between Test Equipment and the SX-939
   - Connect the AM signal generator to the AM antenna terminals (in series with a 1 kΩ dummy resistor).
   - Connect the AC millivolt meter to the TAPE REC terminal jacks.
3. Set the AM signal generator to 30% modulation at 400Hz.
4. Set the AM signal generator output to 30dB at 600kHz.
   Adjust for maximum output (Carry out the ferrite loopstick antenna core adjustment at the same time).
5. Adjust for maximum output with the frequency set at 1,400kHz.
   Adjustments 4 ~ 5 above should be repeated several times until no further significant improvement is obtained.
6. Connect the AM signal generator directly to the AM ANT (antenna) terminals.
7. With a frequency of 1,400kHz and an AM signal generator output of 36dB, adjust for a low frequency output of 70mV.
8. With an AM signal generator output of 80dB, adjust for a low frequency output of 310mV.



ALIGNING THE POWER AMPLIFIER SECTION

1. Nothing should be connected to the input jacks of the SX-939, and an 8Ω dummy resistor should be connected across the speaker terminals.
2. A DC millivolt meter should be connected across between terminal number 10 (25) and earth.
3. Adjustment should be made to bring the voltage to zero.
4. The DC voltmeter should be connected between terminals number 50 (38) and 44 (32).
5. Adjustment should be made to bring the voltage to 50mV.



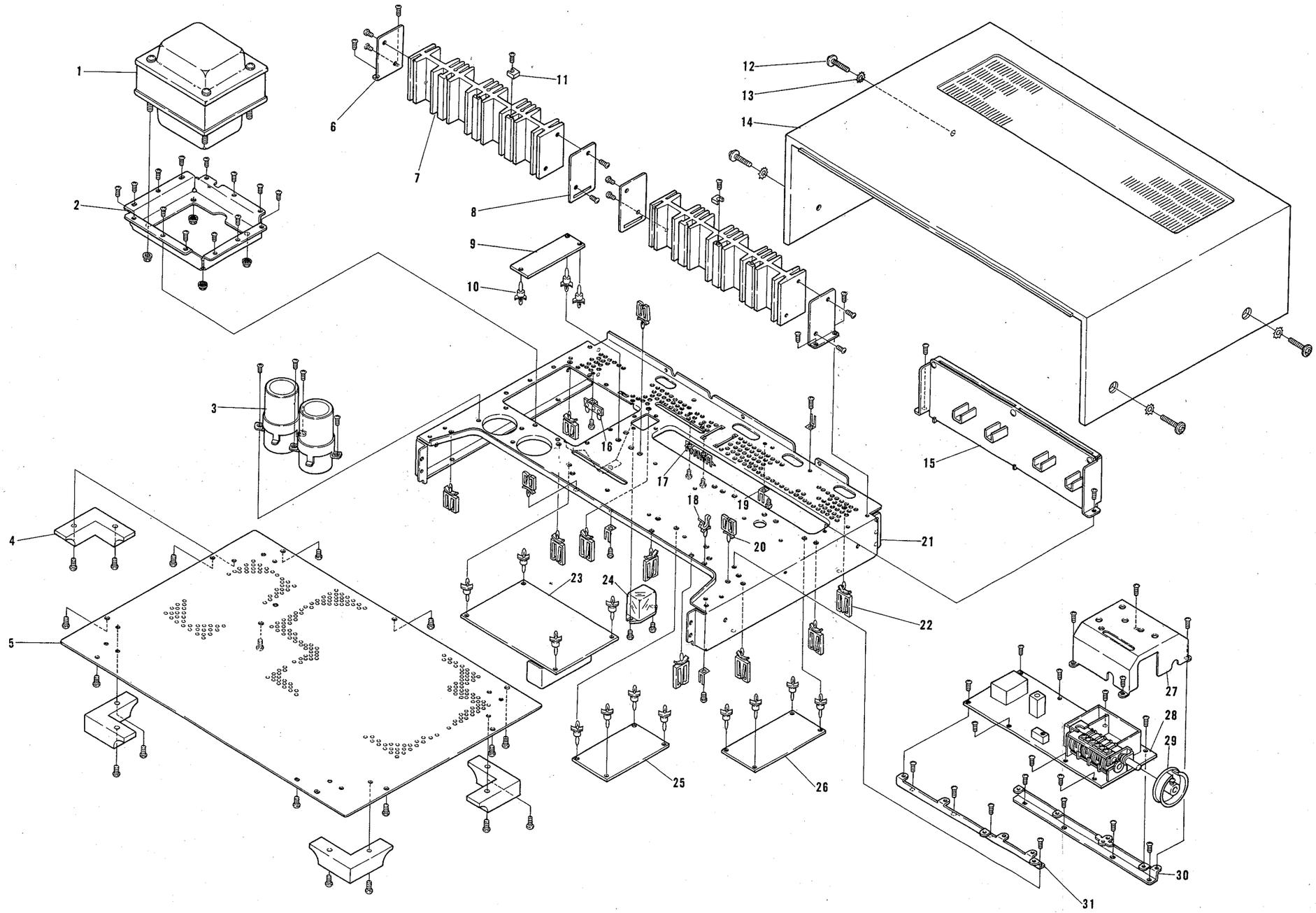
11. EXPLODED VIEW AND PARTS LIST

NOTE:
Parts number is subject to change for the purpose of improvement with notice of a service bulletin.
Service bulletin will be furnished whenever necessary and you are requested to amend parts number in this manual according to the instructions.

Parts List of Exploded View-1

NOTICE: Any parts asterisked(*) are subject to being not supplied.

Key No.	Description	Part No.	
1	Power transformer	ATT-167-A	KCU
	Power transformer	ATT-173-0	F
	Power transformer	ATT-180-A	GN
2*	Power transformer-held metal	ANF-248-0	
3	Electrolytic capacitor 10,000μF 50V	ACH-019-0	
4	Foot	AEC-027-B	
5*	Bottom plate	ANE-055-B	
6*	Heat sink-held metal	ANF-231-0	
7*	Heat sink	ANH-215-A	
8*	Heat sink-held metal	ANF-232-0	
9	Muting circuit assembly	AWM-063-0	
10*	P.C. board holder	AEB-019-0	
11	Varistor STV4H		
12	Screw M4 x 15	ABA-010-A	
13	Washer	B21-011-0	
14	Wooden cabinet	AMM-035-A	
15	Power amplifier assembly	AWH-030-0	
16	Terminal strip (2P)	AKC-015-0	
17	Ground terminal strip (4P)	K13-047-0	
18*	Wire clip (C)	AEC-007-0	
19	Ground terminal strip (2P)	K13-048-0	
20*	Wire clip (A)	AEC-004-0	
21*	Chassis	ANA-068-B	
22*	Wire clip	AEC-064-0	
23	Power supply circuit assembly	AWR-052-0	KCU, F
	Power supply circuit assembly	AWR-056-0	GN
24	Relay	ASR-007-0	
25	Protection circuit assembly	AWM-062-0	
26	Equalizer amplifier assembly	AWF-013-0	
27*	Shield cover	ANF-240-A	
28	Tuner assembly	AWE-041-0	
29	Tuning pulley assembly	AXA-015-A	
30*	P.C. board-held metal (A)	ANF-246-A	
31*	P.C. board-held metal (B)	ANF-247-A	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NOTE:
Parts number is subject to change for the purpose of improvement with notice of a service bulletin.
Service bulletin will be furnished whenever necessary and you are requested to amend parts number in this manual according to the instructions.

Parts List of Exploded View-2

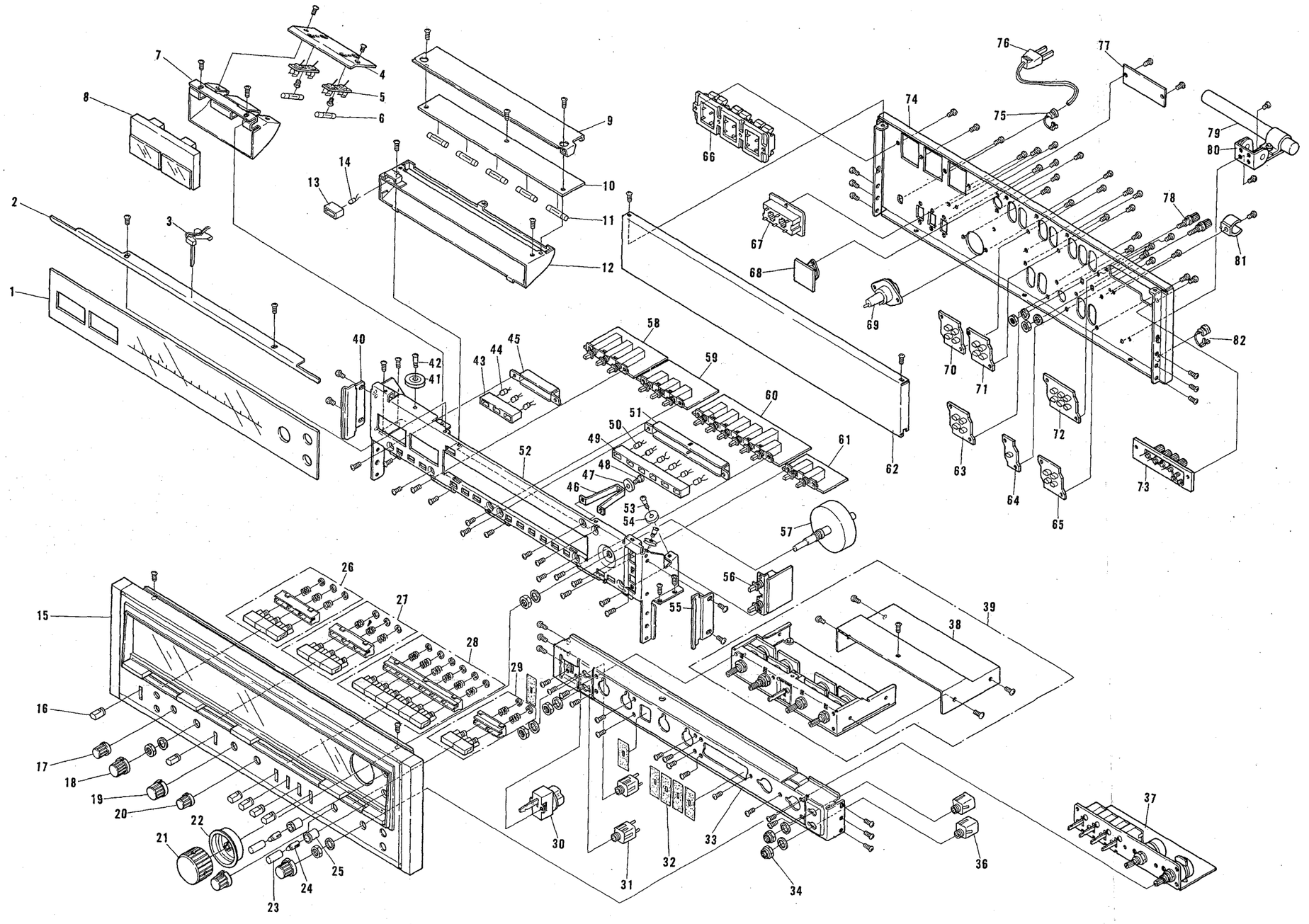
NOTICE: Any parts asterisked(*) are subject to being not supplied.

Key No.	Description	Part No.	
1	Dial scale	AAG-074-A	
2*	Dial scale-held metal	ANF-243-A	
3	Dial pointer assembly	AAF-031-A	
4	Lamp holder	ANG-097-0	
5	Pilot lamp socket	AKK-002-0	
6	Pilot lamp 8V, 0.3A (meter)	AEL-015-0	
7*	Lamp box (B)	ANH-211-B	
8	Meter (Tuning & Signal)	AAW-029-0	
9	P.C. board cover	ANG-100-0	
10	Lamp board assembly	AWX-069-0	
11	Pilot lamp 8V, 0.3A (dial scale)	E22-032-0	
12*	Lamp box (A)	ANH-210-A	
13	Rubber bracket	AEB-031-0	
14	Pilot lamp 8V, 50mA	AEL-014-0	
15	Front panel assembly	ANB-260-B	
16	Knob (Power, Tone, Duplicate, Monitor, 4-CH adaptor)	AAD-040-0	
17	Knob (Treble-sub)	AAB-069-B	
18	Knob (Treble-main)	AAB-068-A	
19	Knob (Bass-main, Volume, Balance)	AAB-068-A	
20	Knob (Bass-sub)	AAB-069-B	
21	Knob (Tuning)	AAA-026-A	
22	Ornamental ring	AAC-034-A	
23	Knob (Dimmer, FM muting)	AAD-082-A	
24	Coupler (knob-to-switch)	AAE-007-0	
25	Spacer (push knob)	AEC-152-A	
26	Knob (SPKR A, B, C)	AAD-064-A	
27	Knob (Low cut, High cut, −20dB)	AAD-065-A	
28	Knob (Function)	AAD-066-A	
29	Knob (Mode, Loudness)	AAD-067-A	
30	Lever switch (Power)	ASK-080-0	KCU
	Lever switch (Power)	ASK-067-0	F
31	Phone jack (Headphone)	K72-026-0	
32	Shading plate	AED-018-0	
33*	Dial frame	AND-072-A	
34	Nut (insulator)	AEC-085-0	
36	Phone jack (Microphone)	K72-024-0	
37	Switch circuit assembly	AWS-067-0	
38*	Shield cover	ANH-206-0	
39	Control amplifier assembly	AWG-027-0	
40*	Shading metal	ANF-249-0	

NOTICE: Any parts asterisked(*) are subject to being not supplied.

Key No.	Description	Part No.	
41*	Pulley	AEC-153-0	
42*	Pulley shaft	ABA-004-0	
43	Rubber bracket	AEB-057-A	
44	Pilot lamp 8V, 50mA	AEL-023-0	
45	Pilot lamp holder (A)	ANG-103-0	
46	Pulley-held metal	ANG-102-A	
47*	Pulley (small)	AEC-101-0	
48*	Pulley shaft	M49-025-E	
49	Rubber bracket	AEB-057-A	
50	Pilot lamp 8V, 50mA	AEL-022-0	
51*	Pilot lamp holder (B)	ANG-104-0	
52*	Sub panel	AND-073-B	
53*	Pulley shaft	M49-025-E	
54*	Pulley (small)	AEC-101-0	
55*	Shading metal	ANF-249-0	
56	Switch circuit assembly	AWS-068-0	
57	Tuning shaft assembly	AXA-056-0	
58	Switch circuit assembly	AWS-064-0	
59	Switch circuit assembly	AWS-066-0	
60	Switch circuit assembly	AWS-069-0	
61	Switch circuit assembly	AWS-065-0	
62*	Shield cover (rear)	ANH-208-A	
63	Phono jack-A (4 jacks)	AKB-014-0	
64	Phono jack (1 jack)	AKB-019-0	
65	Phono jack-A (4 jacks)	AKB-014-0	
66	Speaker output terminal	AKE-014-0	
67	AC socket	AKP-005-0	KCU, F
68	5P connector assembly	AWX-062-0	
69	Fuse holder	AKR-012-0	KCU
	Fuse holder	AKR-001-0	F
70	Phono jack-A (4 jacks)	AKB-014-0	
71	Phono jack-A (4 jacks)	AKB-014-0	
72	Phono jack-B (6 jacks)	AKB-017-0	
73	Antenna terminal board	AKA-002-0	
74*	Rear panel	ANC-107-B	KCU
	Rear panel	ANC-112-A	F
	Rear panel	ANC-114-0	GN
75	AC cord grommet	AEC-079-0	KCU, F
	Connector (AC power)	AKP-008-0	GN
76	AC power cord	ADG-005-A	KCU
	AC power cord	ADG-002-A	F
77*	Model name plate	AAL-180-A	KCU
	Model name plate	AAL-201-0	F
78	Binding post for ground	AKE-012-A	
79	Ferrite loopstick antenna	ATB-026-0	
80	Ferrite antenna holder assembly	AXB-001-A	
81	Antenna clamper	AEC-154-0	
82	AC cord grommet	AEC-079-0	

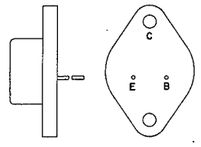
Exploded View-2

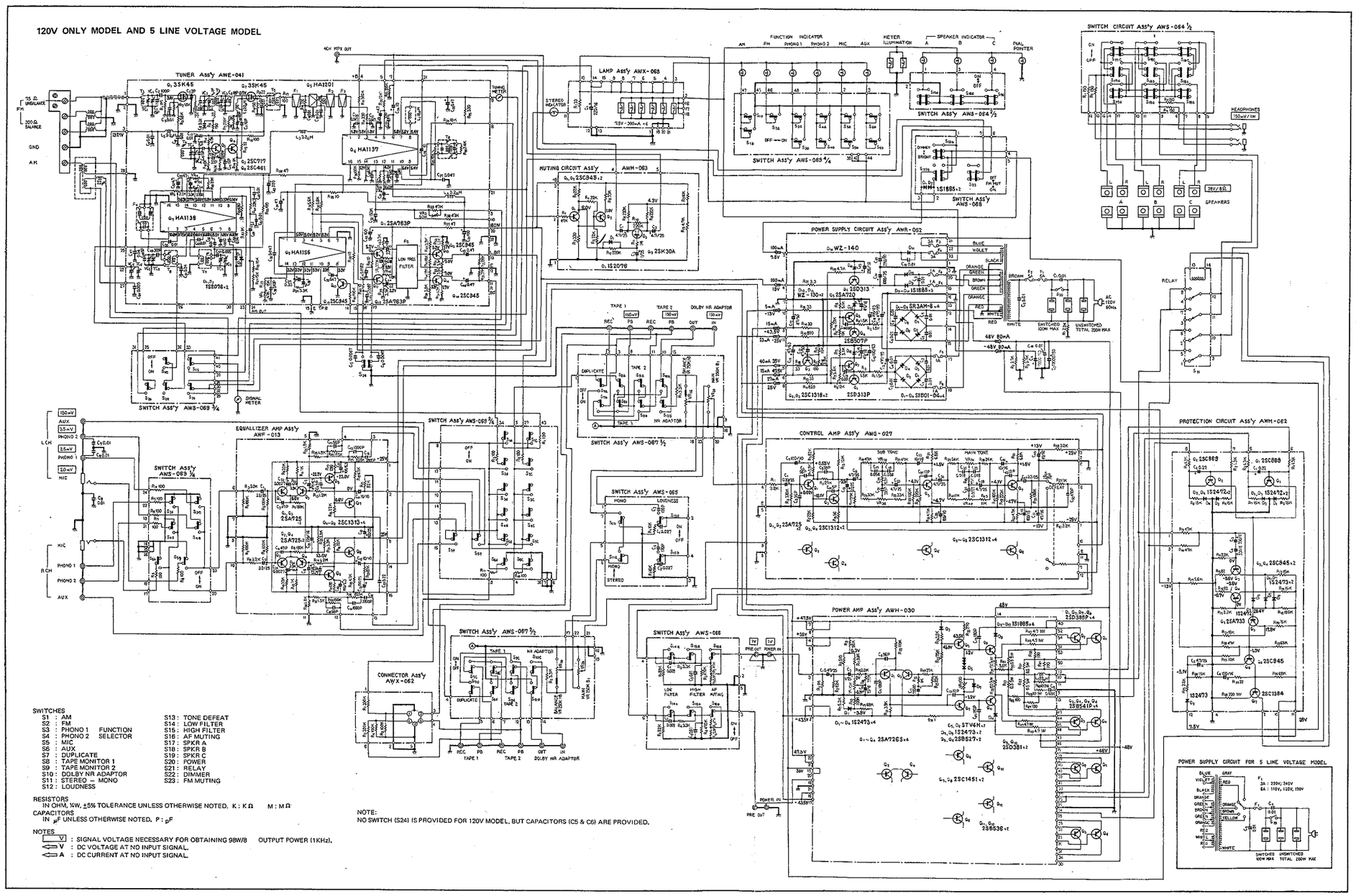


12. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LIST

12. 1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS

2SA745A
2SB530S
2SB541P
2SC1403A
2SD370S
2SD388P




120V ONLY MODEL AND 5 LINE VOLTAGE MODEL
TUNER Ass'y AWE-041
LAMP Ass'y AWX-063
SWITCH Ass'y AWS-063 3/4
SWITCH Ass'y AWS-063 1/4
SWITCH Ass'y AWS-063 2/4
SWITCH Ass'y AWS-063 1/2
SWITCH Ass'y AWS-064 1/2
SWITCH Ass'y AWS-065
SWITCH Ass'y AWS-066
MUTING CIRCUIT Ass'y AWH-063
POWER SUPPLY CIRCUIT Ass'y AWR-062
EQUALLIZER AMP Ass'y AWF-013
CONTROL AMP Ass'y AWG-027
POWER AMP Ass'y AWH-030
PROTECTION CIRCUIT Ass'y AWH-062
CONNECTOR Ass'y AWX-062
SPEAKERS
HEADPHONES
RELAY
POWER SUPPLY CIRCUIT FOR 5 LINE VOLTAGE MODEL
SWITCHES
S1 : AM
S2 : FM
S3 : PHONO 1 FUNCTION
S4 : PHONO 2 SELECTOR
S5 : MIC
S6 : AUX
S7 : DUPLICATE
S8 : TAPE MONITOR 1
S9 : TAPE MONITOR 2
S10 : DOLBY NR ADAPTOR
S11 : STEREO – MONO
S12 : LOUDNESS
S13 : TONE DEFEAT
S14 : LOW FILTER
S15 : HIGH FILTER
S16 : AF MUTING
S17 : SPKR A
S18 : SPKR B
S19 : SPKR C
S20 : POWER
S21 : RELAY
S22 : DIMMER
S23 : FM MUTING
RESISTORS
IN OHM, ¼W, ±5% TOLERANCE UNLESS OTHERWISE NOTED. K : KΩ M : MΩ
CAPACITORS
IN μF UNLESS OTHERWISE NOTED. P : pF
NOTES
V : SIGNAL VOLTAGE NECESSARY FOR OBTAINING 98W/8 OUTPUT POWER (1KHz).
V : DC VOLTAGE AT NO INPUT SIGNAL.
A : DC CURRENT AT NO INPUT SIGNAL.
NOTE:
NO SWITCH (S24) IS PROVIDED FOR 120V MODEL, BUT CAPACITORS (C5 & C6) ARE PROVIDED.

- CAPACITORS: IN μF UNLESS OTHERWISE NOTED p: pF.
- RESISTORS: IN Ω, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ.

Miscellaneous Parts

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	250V	ACG-001-0	
C2	Ceramic	0.01	250V	ACG-003-0	KCU
	Ceramic	0.01	250V	ACG-001-0	F
C3	Electrolytic	10,000	50V	ACH-019-0	
C4	Electrolytic	10,000	50V	ACH-019-0	
C5	Mylar	0.0047	50V	CQMA 472J 50	
C6	Mylar	0.0047	50V	CQMA 472J 50	
C7	Ceramic	0.01	50V	CKDYF 103Z 50	
C8	Ceramic	0.01	50V	CKDYF 103Z 50	
C9	Ceramic	0.01	50V	CKDYF 103Z 50	
C10	Ceramic	0.01	150V	ACG-004-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	2.2M	½W	PR½PS 225J	
R2	Metal oxide	2.7k	2W	RS2P 272J	
R3	Metal oxide	2.7k	2W	RS2P 272J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		
Q2	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		
Q3	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q4	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q5	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q6	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q7	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		
Q8	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		

Continued on the Next Page

SWITCHES

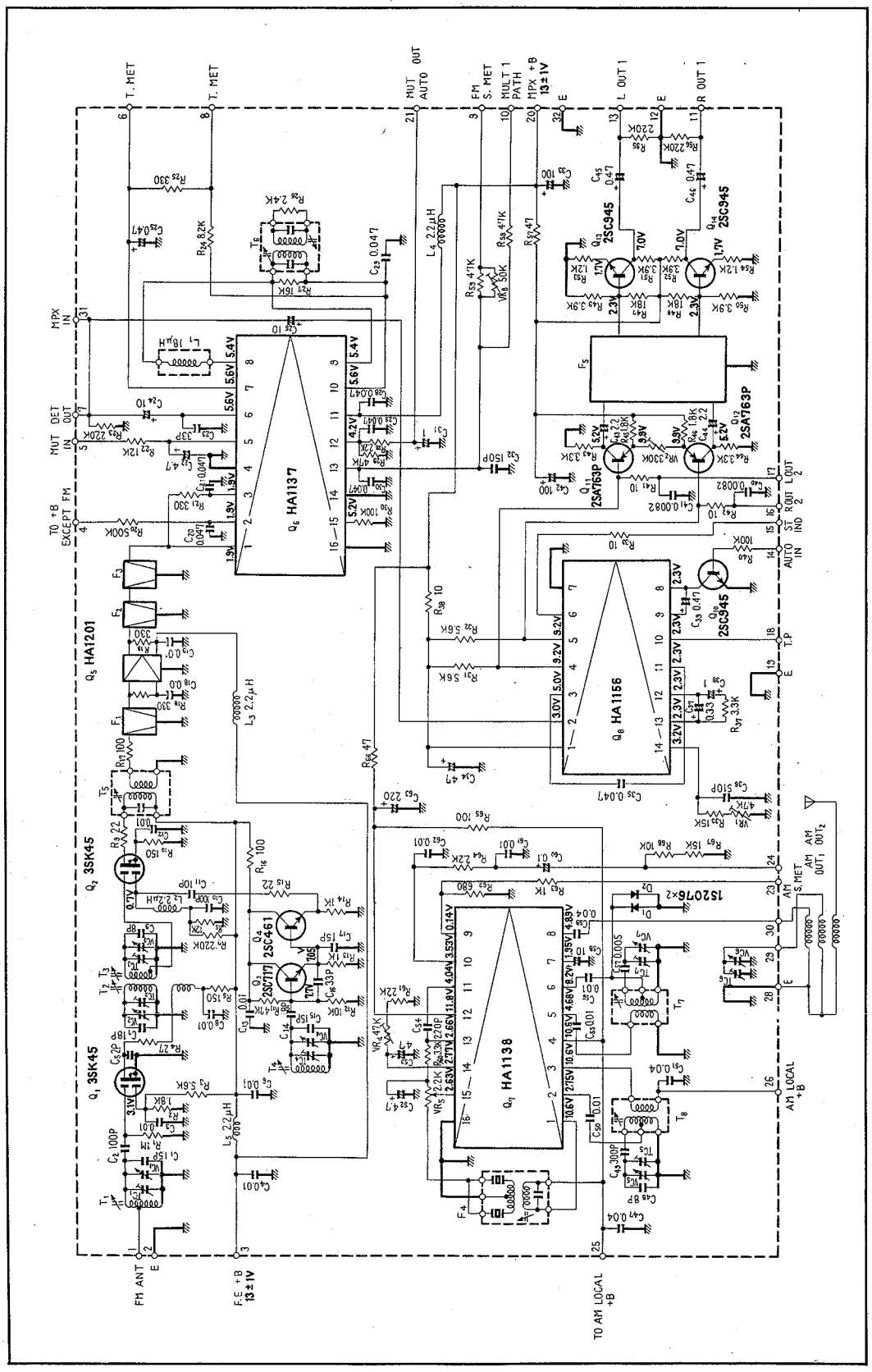
Symbol	Description	Part No.	
	Lever switch (Power)	ASK-080-0	KCU
	Lever switch (Power)	ASK-067-0	F
	Relay	ASR-007-0	
	Fuse holder	AKR-012-0	KCU
	Fuse holder	AKR-001-0	F
	Slide switch (de-emphasis)	ASH-008-0	F

OTHERS

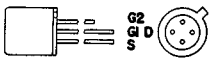
Symbol	Description	Part No.	
	Tuner assembly	AWE-041-0	
	Power amplifier assembly	AWH-030-0	
	Control amplifier assembly	AWG-027-0	
	Equalizer amplifier assembly	AWF-013-0	
	Protection circuit assembly	AWM-062-0	
	Power supply circuit assembly	AWR-052-0	
	Switch circuit assembly (function)	AWS-069-0	
	Switch circuit assembly (speakers)	AWS-064-0	
	Switch circuit assembly (mode, loudness)	AWS-065-0	
	Switch circuit assembly (filters)	AWS-066-0	
	Switch circuit assembly (tape monitor)	AWS-067-0	
	Switch circuit assembly (dimmer)	AWS-068-0	
	Lamp board assembly	AWX-069-0	
	5P connector assembly	AWX-062-0	
	Muting circuit assembly	AWM-063-0	
	Front panel assembly	ANB-260-B	
	Wooden cabinet assembly	AMM-035-A	
	Foot	AEC-027-B	
	Tuning shaft assembly	AXA-056-0	
	Tuning pulley assembly	AXA-015-A	
	Ferrite antenna holder assembly	AXB-001-A	
	Dial pointer assembly	AAF-031-A	
	Dial scale	AAG-074-A	
	Meter (Tuning and Signal)	AAW-029-0	
	Knob (Tuning)	AAA-026-A	
	Knob (Bass-main, Treble-main, Volume, Balance)	AAB-068-A	
	Knob (Bass-sub, Treble-sub)	AAB-069-B	
	Knob (Power, Tone, Duplicate, Monitor, 4-CH adaptor)	AAD-040-0	
	Knob (SPKR A, B, C)	AAD-064-A	
	Knob (Low cut, High cut, −20dB)	AAD-065-A	
	Knob (Function)	AAD-066-A	
	Knob (Mode, Loudness)	AAD-067-A	
	Coupler (Knob-to-switch)	AAE-007-0	
	Knob (Dimmer, FM muting)	AAD-082-A	
	Phono jack-B (6 jacks)	AKB-017-0	
	Phono jack-A (4 jacks)	AKB-014-0	
	Phono jack (1 jack)	AKB-019-0	
	Antenna terminal board	AKA-002-0	

Symbol	Description	Part No.	
	Binding post for ground	AKE-012-A	
	Power transformer	ATT-167-A	KCU
	Power transformer	ATT-173-0	F
	Ferrite loopstick antenna	ATB-026-0	
	Balun	T22-025-A	
	Fuse 5A (AC power)	AEK-021-0	KCU
	Fuse 3A (AC power)	AEK-101-0	F
	Pilot lamp 8V, 50mA (stereo indicator)	AEL-014-0	
	Pilot lamp 8V, 0.3A (dial scale)	E22-032-0	
	Pilot lamp 8V, 0.3A (meter)	AEL-015-0	
	Pilot lamp 8V, 50mA (program indicator)	AEL-022-0	
	Pilot lamp 8V, 50mA (program indicator)	AEL-023-0	
	Fuse 1A (protection)	AEK-106-0	
	Fuse 3A (protection)	AEK-101-0	
	Fuse 5A (protection)	AEK-039-0	KCU
	AC socket	AKP-005-0	
	Speaker output terminal	AKE-014-0	
	Phone jack (Headphone)	K72-026-0	
	Phone jack (Microphone)	K72-024-0	
	Socket (power transistor)	AKH-001-0	
	Jumper plug	AKM-004-A	
	Pilot lamp socket	AKK-002-0	
	AC cord grommet	AEC-079-0	
	Spacer (insulator)	AEC-076-0	
	Screw M4 x 15	ABA-010-A	
	AC power cord	ADG-005-A	KCU
	AC power cord	ADG-002-A	F
	Operating instructions	ARB-099-0	
	FM T-type antenna	ADH-002-0	
	Packing case	AHD-212-A	
	Side pad (L)	AHA-066-A	
	Side pad (R)	AHA-067-A	
	Inside packing	AHC-014-A	

12. 2 TUNER ASSEMBLY (AWE-041-0)

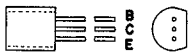


3SK45



2SC461
2SC717

2SA725



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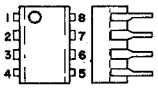
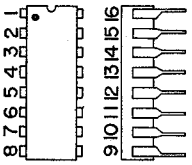
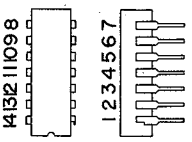


HA1137
HA1138

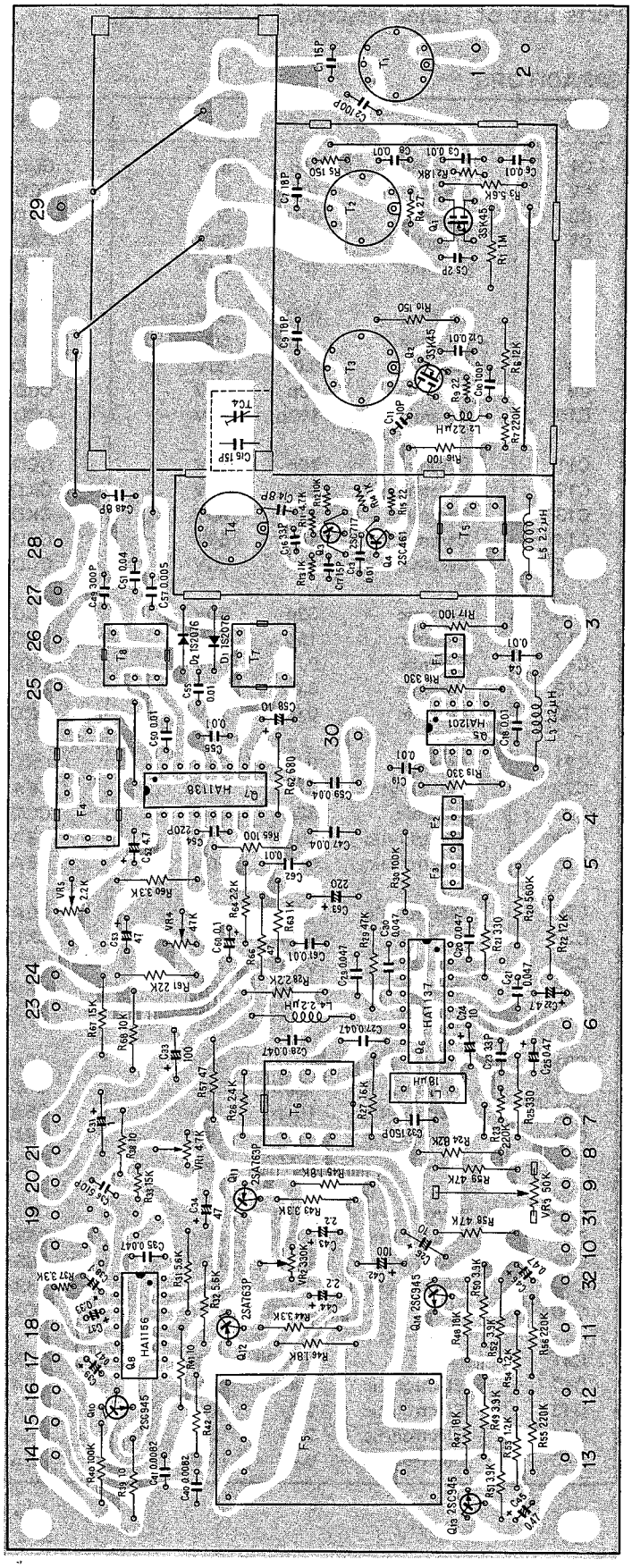


HA1156



2SA763P
2SC945

Foil Side



Tuner Assembly

Parts List of Tuner Assembly (AWE-041-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	15p	50V	CCDSH 150K 50	
C2	Ceramic	100p	50V	CCDSL 101K 50	
C3	Ceramic	0.01	50V	CKDYF 103Z 50	
C4	Ceramic	0.01	50V	CKDYF 103Z 50	
C5	Ceramic	2p	50V	CCDSL 020C 50	
C6	Ceramic	0.01	50V	CKDYF 103Z 50	
C7	Ceramic	18p	50V	CCDSH 180K 50	
C8	Ceramic	0.01	50V	CKDYF 103Z 50	
C9	Ceramic	18p	50V	CCDSH 180K 50	
C10	Ceramic	100p	50V	CCDSL 101K 50	
C11	Ceramic	10p	50V	CCDSL 100F 50	
C12	Ceramic	0.01	50V	CKDYF 103Z 50	
C13	Ceramic	0.01	50V	CKDYB 103K 50	
C14	Ceramic	8p	50V	CCDLH 080F 50	
C15	Ceramic	15p	50V	CCDLH 150K 50	
C16	Ceramic	33p	50V	CCDCH 330K 50	
C17	Ceramic	15p	50V	CCDCH 150K 50	
C18	Ceramic	0.01	50V	CKDYF 103Z 50	
C19	Ceramic	0.01	50V	CKDYF 103Z 50	
C20	Ceramic	0.047	25V	CKDBC 473Z 25	
C21	Ceramic	0.047	25V	CKDBC 473Z 25	
C22	Electrolytic	4.7	25V	CEA 4R7P 25	
C23	Ceramic	33p	50V	CCDSL 330K 50	
C24	Electrolytic	10	16V	CEA 100P 16	
C25	Electrolytic	0.47	50V	CEA R47P 50	
C26	Electrolytic	10	16V	CEA 100P 16	
C27	Ceramic	0.047	25V	CKDBC 473Z 25	
C28	Ceramic	0.047	25V	CKDBC 473Z 25	
C29	Ceramic	0.047	25V	CKDBC 473Z 25	
C30	Ceramic	0.047	25V	CKDBC 473Z 25	
C31	Electrolytic	1	50V	CEA 010P 50	
C32	Ceramic	150p	50V	CCDSL 151K 50	
C33	Electrolytic	100p	16V	CEA 101P 16	
C34	Electrolytic	47	16V	CEA 470P 16	
C35	Mylar	0.047	50V	CQMA 473K 50	
C36	Styrol	510p	50V	CQSH 511J 50	
C37	Electrolytic	0.33	25V	CSSA R33M 25	
C38	Electrolytic	1	10V	CSSA 010M 10	
C39	Electrolytic	0.47	25V	CSSA R47M 25	
C40	Mylar	0.0082	50V	CQMA 822J 50	
C41	Mylar	0.0082	50V	CQMA 822J 50	
C42	Electrolytic	100	16V	CEA 101P 16	
C43	Electrolytic	2.2	25V	CEA 2R2P 25	
C44	Electrolytic	2.2	25V	CEA 2R2P 25	
C45	Electrolytic	0.47	50V	CEA R47P 50	

Symbol	Description			Part No.	
C46	Electrolytic	0.47	50V	CEA R47P 50	
C47	Ceramic	0.04	50V	CKDYF 403Z 50	
C48	Ceramic	8p	50V	CCDXL 080F 50	
C49	Styrol	300p	50V	CQSA 301J 50	
C50	Mylar	0.01	50V	CQMA 103K 50	
C51	Ceramic	0.04	50V	CKDYF 403Z 50	
C52	Electrolytic	4.7	25V	CEA 4R7P 25	
C53	Electrolytic	47	6V	CEA 470P 6	
C54	Ceramic	220p	50V	CCDSL 221K 50	
C55	Ceramic	0.01	50V	CKDYF 103Z 50	
C56	Ceramic	0.01	50V	CKDYF 103Z 50	
C57	Ceramic	0.005	50V	CKDYF 502Z 50	
C58	Electrolytic	10	16V	CEA 100P 16	
C59	Ceramic	0.04	50V	CKDYF 403Z 50	
C60	Electrolytic	0.1	25V	CSSA 0R1M 25	
C61	Ceramic	0.01	50V	CKDYB 103K 50	
C62	Ceramic	0.01	50V	CKDYB 103K 50	
C63	Electrolytic	220	16V	CEA 221P 16	
C64					
VC1	Tuning capacitor			ACK-006-0	
TC4	Ceramic trimmer			C43-007-A	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	1M	RD¼PS 105J	
R2	Carbon film	1.8k	RD¼VS 182J	
R3	Carbon film	5.6k	RD¼PS 562J	
R4	Carbon film	27	RD¼VS 270J	
R5	Carbon film	150	RD¼VS 151J	
R6	Carbon film	12k	RD¼PS 123J	
R7	Carbon film	220k	RD¼VS 224J	
R8				
R9	Carbon film	22	RD¼VS 220J	
R10	Carbon film	150	RD¼PS 151J	
R11	Carbon film	4.7k	RD¼VS 472J	
R12	Carbon film	10k	RD¼VS 103J	
R13	Carbon film	1k	RD¼VS 102J	
R14	Carbon film	1k	RD¼VS 102J	
R15	Carbon film	22	RD¼VS 220J	
R16	Carbon film	100	RD¼PS 101J	
R17	Carbon film	100	RD¼PS 101J	
R18	Carbon film	330	RD¼PS 331J	
R19	Carbon film	330	RD¼PS 331J	
R20	Carbon film	560k	RD¼PS 564J	

Continued on the Next Page

Symbol	Description		Part No.	
R21	Carbon film	330	RD¼PS 331J	
R22	Carbon film	12k	RD¼PS 123J	
R23	Carbon film	220k	RD¼VS 224J	
R24	Carbon film	8.2k	RD¼PS 822J	
R25	Carbon film	330	RD¼PS 331J	
R26	Carbon film	2.4k	RD¼VS 242J	
R27	Carbon film	16k	RD¼PS 163J	
R28	Carbon film	2.2k	RD¼PS 222J	
R29	Carbon film	47k	RD¼PS 473J	
R30	Carbon film	100k	RD¼PS 104J	
R31	Carbon film	5.6k	RD¼PS 562J	
R32	Carbon film	5.6k	RD¼PS 562J	
R33	Carbon film	15k	RD¼VS 153J	
R34				
R35				
R36				
R37	Carbon film	3.3k	RD¼VS 332J	
R38	Carbon film	10	RD¼VS 100J	
R39	Carbon film	10	RD¼PS 100J	
R40	Carbon film	100k	RD¼PS 104J	
R41	Carbon film	10	RD¼PS 100J	
R42	Carbon film	10	RD¼PS 100J	
R43	Carbon film	3.3k	RD¼PS 332J	
R44	Carbon film	3.3k	RD¼PS 332J	
R45	Carbon film	1.8k	RD¼PS 182J	
R46	Carbon film	1.8k	RD¼PS 182J	
R47	Carbon film	18k	RD¼PS 183J	
R48	Carbon film	18k	RD¼PS 183J	
R49	Carbon film	3.9k	RD¼PS 392J	
R50	Carbon film	3.9k	RD¼PS 392J	
R51	Carbon film	3.9k	RD¼PS 392J	
R52	Carbon film	3.9k	RD¼PS 392J	
R53	Carbon film	1.2k	RD¼PS 122J	
R54	Carbon film	1.2k	RD¼PS 122J	
R55	Carbon film	220k	RD¼PS 224J	
R56	Carbon film	220k	RD¼PS 224J	
R57	Carbon film	47	RD¼PS 470J	
R58	Carbon film	47k	RD¼PS 473J	
R59	Carbon film	47k	RD¼PS 473J	
R60	Carbon film	3.3k	RD¼PS 332J	
R61	Carbon film	22k	RD¼PS 223J	
R62	Carbon film	680	RD¼PS 681J	
R63	Carbon film	1k	RD¼PS 102J	
R64	Carbon film	2.2k	RD¼PS 222J	
R65	Carbon film	100	RD¼PS 101J	
R66	Carbon film	47	RD¼PS 470J	
R67	Carbon film	15k	RD¼PS 153J	
R68	Carbon film	10k	RD¼PS 103J	

POTENTIOMETERS

Symbol	Description	Part No.	
VR1	Variable resistor 4.7k-B, Semi-fixed	C92-055-0	
VR2	Variable resistor 330k-B, Semi-fixed	ACP-042-0	
VR3	Variable resistor 50k-B, Semi-fixed	ACP-043-0	
VR4	Variable resistor 47k-B, Semi-fixed	C92-048-0	
VR5	Variable resistor 2.2k-B, Semi-fixed	ACP-001-0	

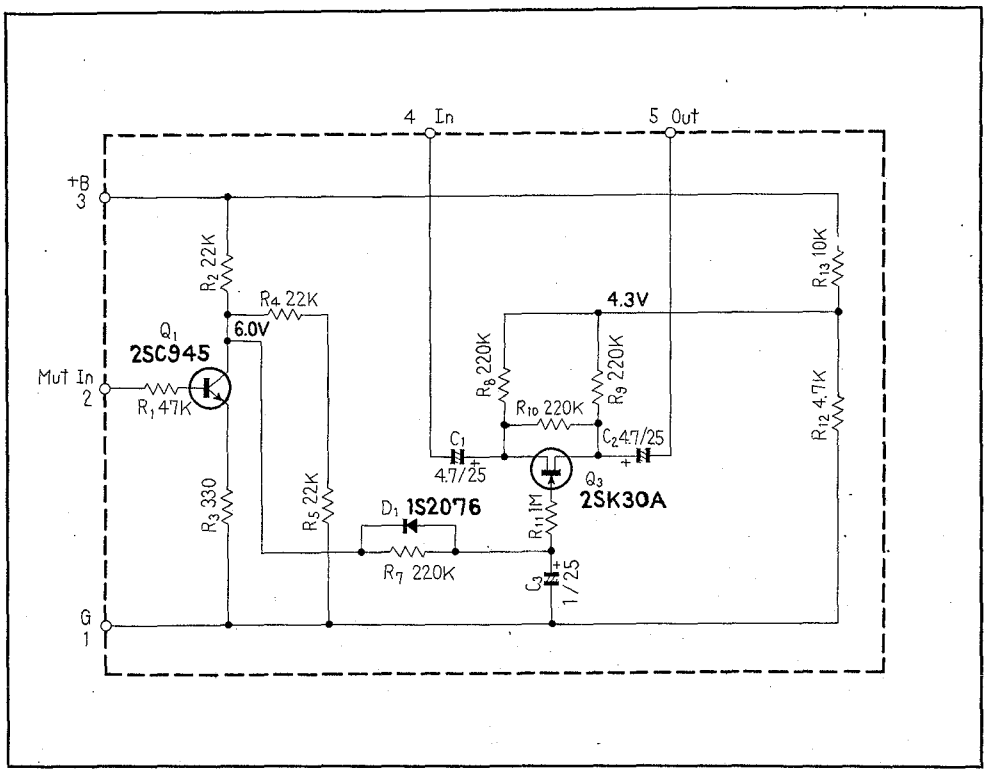
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	FET	3SK45-B		
Q2	FET	3SK45-B		
Q3	Transistor	2SC717		
Q4	Transistor	2SC461-B		
Q5	IC	HA1201		
Q6	IC	HA1137		
Q7	IC	HA1138		
Q8	IC	HA1156		
Q9				
Q10	Transistor	2SC945-Q, R or S		
Q11	Transistor	2SA763P-6 or 5 (2SA725-F or G)		
Q12	Transistor	2SA763P-6 or 5 (2SA725-F or G)		
Q13	Transistor	2SC945-Q, R or S		
Q14	Transistor	2SC945-Q, R or S		
D1	Diode	1S2076		
D2	Diode	1S2076		

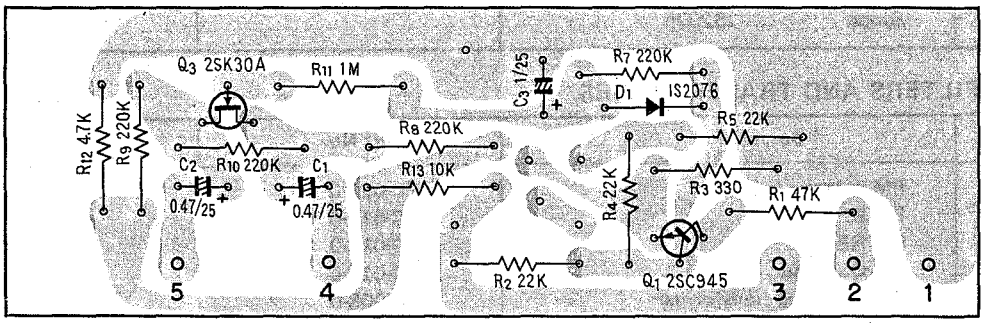
COILS, FILTERS AND TRANSFORMERS

Symbol	Description	Part No.	
T1	FM antenna coil	ATC-021-0	
T2	FM RF coil	ATC-015-0	
T3	FM RF coil	ATC-016-0	
T4	FM OSC coil	ATC-022-0	
T5	FM matching transformer	ATE-008-0	
T6	FM IF transformer	T73-035-A	
T7	AM RF coil	ATB-014-0	
T8	AM OSC coil	ATB-013-0	
F1	FM ceramic filter	ATF-013-B	
F2	FM ceramic filter	ATF-013-B	
F3	FM ceramic filter	ATF-013-B	
F4	AM ceramic filter	ATF-009-0	
F5	Low pass filter	ATF-019-0	
L1	Choke coil	ATH-007-0	
L2	RF choke coil	T24-028-A	
L3	RF choke coil	T24-028-A	
L4	RF choke coil	T24-028-A	
L5	RF choke coil	T24-028-A	

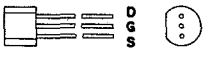
12. 3 MUTING CIRCUIT ASSEMBLY (AWM-063-0)



Foil Side



2SK30A



2SC945

Parts List of Muting Circuit Assembly (AWM-063-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	4.7	25V	CEA 4R7P 25	
C2	Electrolytic	4.7	25V	CEA 4R7P 25	
C3	Electrolytic	1	25V	CSSA 010M 25	

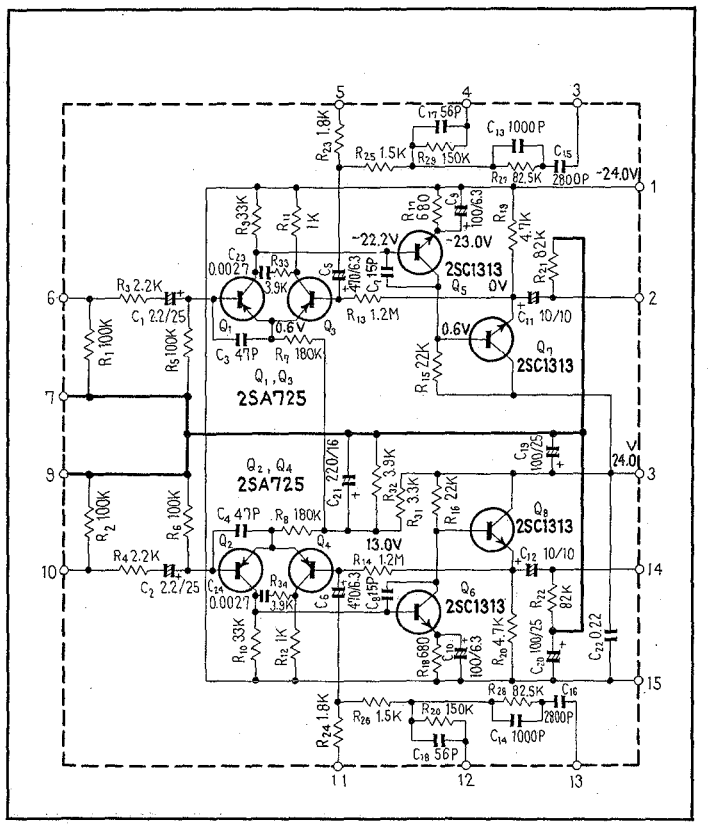
RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	47k	RD¼PS 473J	
R2	Carbon film	22k	RD¼PS 223J	
R3	Carbon film	330	RD¼PS 331J	
R4	Carbon film	22k	RD¼PS 223J	
R5	Carbon film	22k	RD¼PS 223J	
R6				
R7	Carbon film	220k	RD¼PS 224J	
R8	Carbon film	220k	RD¼PS 224J	
R9	Carbon film	220k	RD¼PS 224J	
R10	Carbon film	220k	RD¼PS 224J	
R11	Carbon film	1M	RD¼PS 105J	
R12	Carbon film	4.7k	RD¼PS 472J	
R13	Carbon film	10k	RD¼PS 103J	

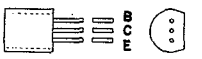
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SC945-Q		
Q2				
Q3	FET	2SK30A-Y		
D1	Diode	1S2076		

12. 4 EQUALIZER AMPLIFIER ASSEMBLY (AWF-013-0)

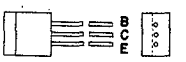


2SA725
2SC1313

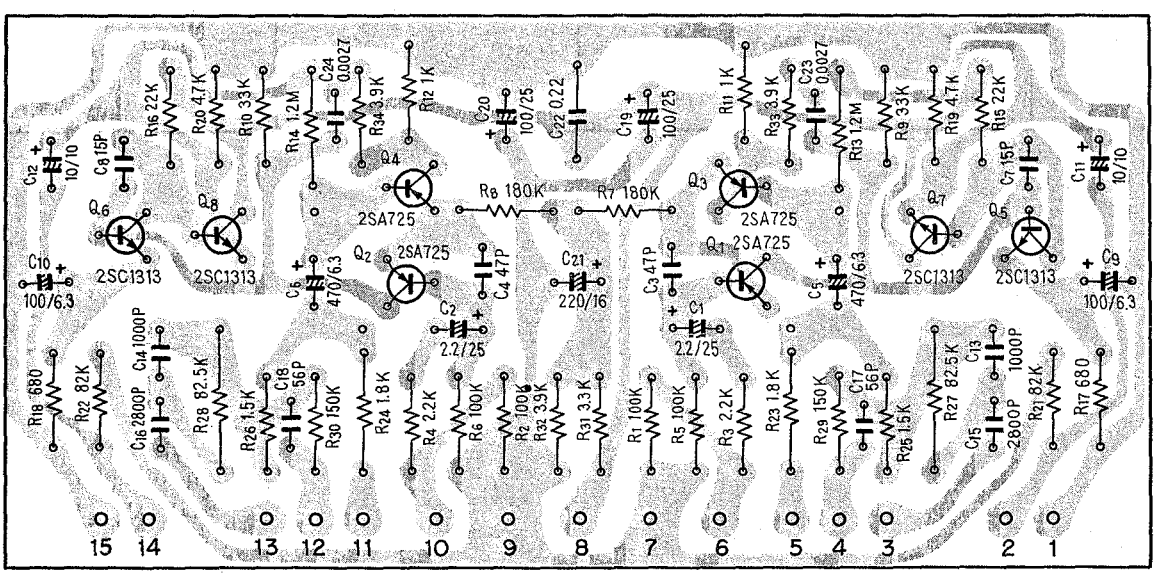


2SA640
2SA763P
2SC1222

2SC1345



Foil Side



Parts List of Equalizer Amplifier Assembly (AWF-013-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	2.2	25V	CSSA 2R2M 25	
C2	Electrolytic	2.2	25V	CSSA 2R2M 25	
C3	Ceramic	47p	50V	CCDSL 470K 50	
C4	Ceramic	47p	50V	CCDSL 470K 50	
C5	Electrolytic	470	6V	CEANL 471P 6	
C6	Electrolytic	470	6V	CEANL 471P 6	
C7	Ceramic	15p	50V	CCDSL 150K 50	
C8	Ceramic	15p	50V	CCDSL 150K 50	
C9	Electrolytic	100	6V	CEANL 101P 6	
C10	Electrolytic	100	6V	CEANL 101P 6	
C11	Electrolytic	10	10V	CEANL 100P 10	
C12	Electrolytic	10	10V	CEANL 100P 10	
C13	Styrol	0.001	50V	CQSA 102G 50	
C14	Styrol	0.001	50V	CQSA 102G 50	
C15	Styrol	0.0028	50V	CQSA 282G 50	
C16	Styrol	0.0028	50V	CQSA 282G 50	
C17	Ceramic	56p	50V	CCDSL 560K 50	
C18	Ceramic	56p	50V	CCDSL 560K 50	
C19	Electrolytic	100	25V	CEANL 101P 25	
C20	Electrolytic	100	25V	CEANL 101P 25	
C21	Electrolytic	220	16V	CEANL 221P 16	
C22	Mylar	0.22	50V	CQMA 224K 50	
C23	Mylar	0.0027	50V	CQMA 272K 50	
C24	Mylar	0.0027	50V	CQMA 272K 50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	100k	RD¼PM 104J	
R2	Carbon film	100k	RD¼PM 104J	
R3	Carbon film	2.2k	RD¼PM 222J	
R4	Carbon film	2.2k	RD¼PM 222J	
R5	Carbon film	100k	RD¼PM 104J	
R6	Carbon film	100k	RD¼PM 104J	
R7	Carbon film	180k	RD¼PM 184JNL	
R8	Carbon film	180k	RD¼PM 184JNL	
R9	Carbon film	33k	RD¼PM 333J	
R10	Carbon film	33k	RD¼PM 333J	
R11	Carbon film	1k	RD¼PM 102J	
R12	Carbon film	1k	RD¼PM 102J	
R13	Carbon film	1.2M	RD¼PS 125J	
R14	Carbon film	1.2M	RD¼PS 125J	
R15	Carbon film	22k	RD¼PM 223J	
R16	Carbon film	22k	RD¼PM 223J	
R17	Carbon film	680	RD¼PM 681J	
R18	Carbon film	680	RD¼PM 681J	
R19	Carbon film	4.7k	RD¼PM 472J	
R20	Carbon film	4.7k	RD¼PM 472J	

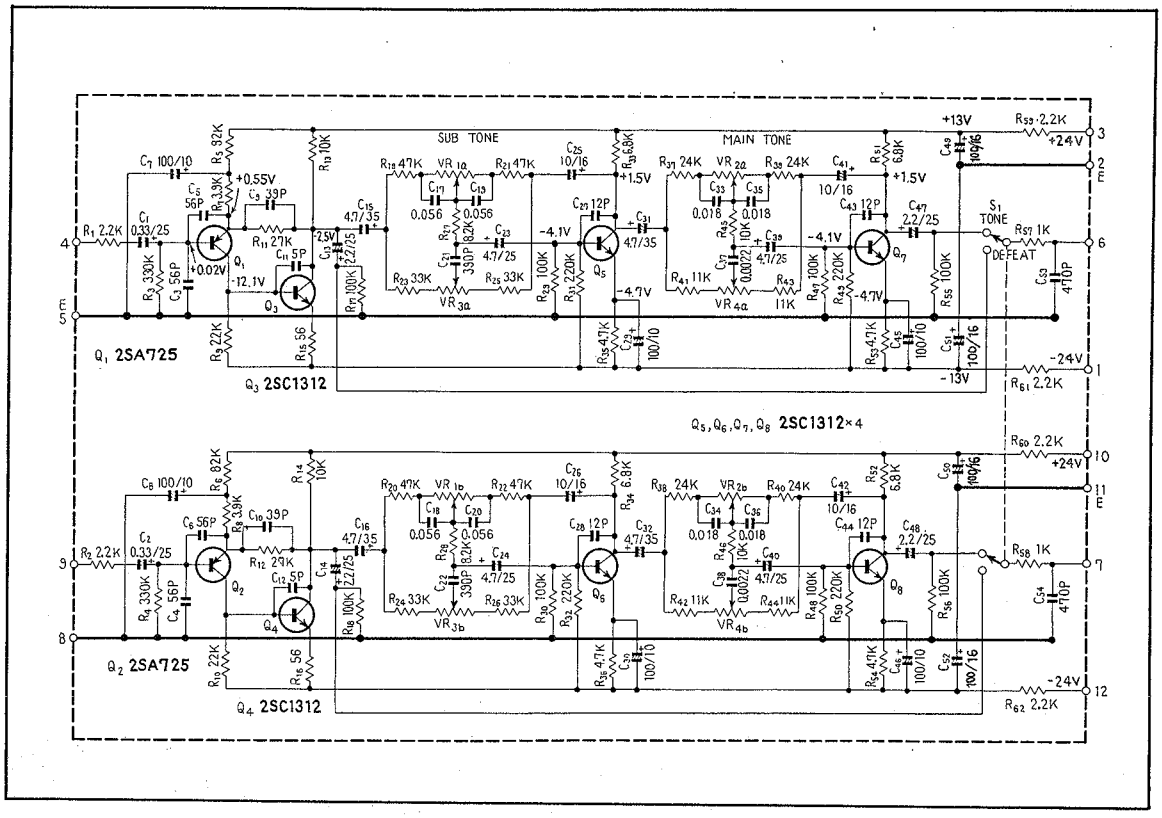
Continued on the Next Page

Symbol	Description		Part No.	
R21	Carbon film	82k	RD¼PM 823J	
R22	Carbon film	82k	RD¼PM 823J	
R23	Carbon film	1.8k	RD¼PS 182J	
R24	Carbon film	1.8k	RD¼PS 182J	
R25	Carbon film	1.5k	RD¼PM 152J	
R26	Carbon film	1.5k	RD¼PM 152J	
R27	Metal film	82.5k ½W	RN½SR 8252F	
R28	Metal film	82.5k ½W	RN½SR 8252F	
R29	Carbon film	150k	RD¼PM 154J	
R30	Carbon film	150k	RD¼PM 154J	
R31	Carbon film	3.3k	RD¼PM 332J	
R32	Carbon film	3.9k	RD¼PM 392J	
R33	Carbon film	3.9k	RD¼PM 392J	
R34	Carbon film	3.9k	RD¼PM 392J	

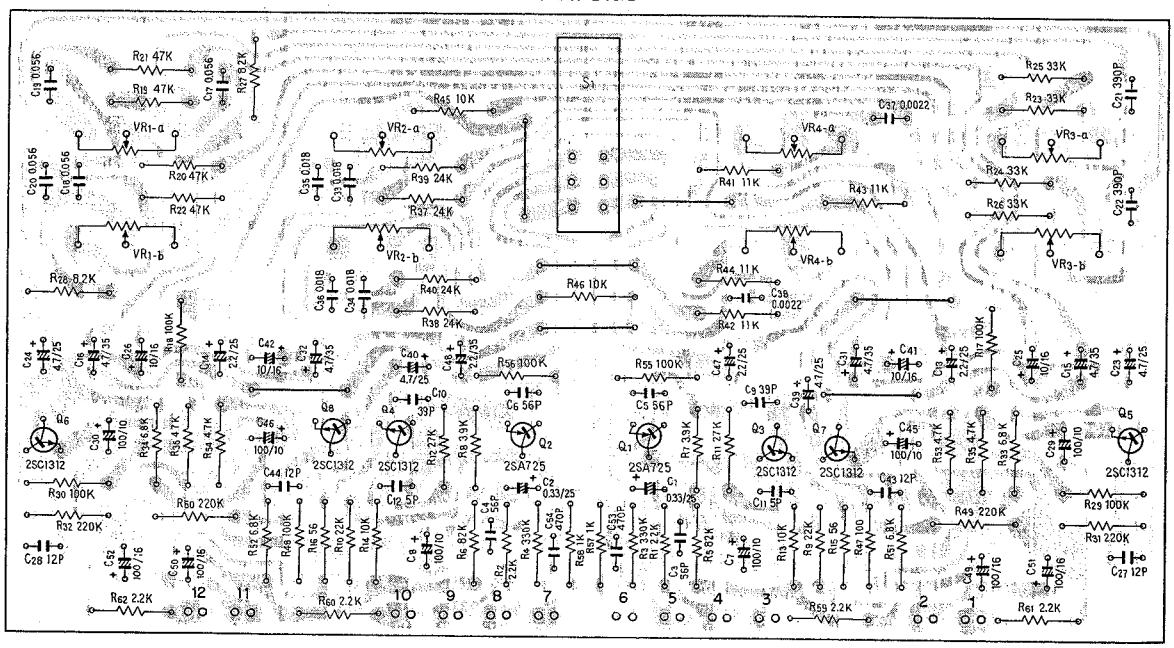
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SA725-G or F (2SA763P-5 or 6) (2SA640-K, L or M)		
Q2	Transistor	2A725-G or F (2SA763P-5 or 6) (2SA640-K, L or M)		
Q3	Transistor	2A725-G or F (2SA763P-5 or 6) (2SA640-K, L or M)		
Q4	Transistor	2A725-G or F (2SA763P-5 or 6) (2SA640-K, L or M)		
Q5	Transistor	2SC1313-G or F (2SC1345-E or D) (2SC1222-F, E or U)		
Q6	Transistor	2SC1313-G or F (2SC1345-E or D) (2SC1222-F, E or U)		
Q7	Transistor	2SC1313-G or F (2SC1345-E or D) (2SC1222-F, E or U)		
Q8	Transistor	2SC1313-G or F (2SC1345-E or D) (2SC1222-F, E or U)		

12. 5 CONTROL AMPLIFIER ASSEMBLY (AWG-027-0)



Foil Side



2SA725
2SC1312

2SA763P
2SA640
2SC900

2SC1344

Parts List of Control Amplifier Assembly (AWG-027-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.33	25V	CSSA R33M 25	
C2	Electrolytic	0.33	25V	CSSA R33M 25	
C3	Ceramic	56p	50V	CCDSL 560K 50	
C4	Ceramic	56p	50V	CCDSL 560K 50	
C5	Ceramic	56p	50V	CCDSL 560K 50	
C6	Ceramic	56p	50V	CCDSL 560K 50	
C7	Electrolytic	100	10V	CEA 101P 10	
C8	Electrolytic	100	10V	CEA 101P 10	
C9	Ceramic	39p	50V	CCDSL 390K 50	
C10	Ceramic	39p	50V	CCDSL 390K 50	
C11	Ceramic	5p	50V	CCDSL 050D 50	
C12	Ceramic	5p	50V	CCDSL 050D 50	
C13	Electrolytic	2.2	25V	CSSA 2R2M 25	
C14	Electrolytic	2.2	25V	CSSA 2R2M 25	
C15	Electrolytic	4.7	35V	CEA 4R7P 35	
C16	Electrolytic	4.7	35V	CEA 4R7P 35	
C17	Mylar	0.056	50V	CQMA 563J 50	
C18	Mylar	0.056	50V	CQMA 563J 50	
C19	Mylar	0.056	50V	CQMA 563J 50	
C20	Mylar	0.056	50V	CQMA 563J 50	
C21	Styrol	390p	50V	CQSA 391J 50	
C22	Styrol	390p	50V	CQSA 391J 50	
C23	Electrolytic	4.7	25V	CEANL 4R7P 25	
C24	Electrolytic	4.7	25V	CEANL 4R7P 25	
C25	Electrolytic	10	16V	CEA 100P 16	
C26	Electrolytic	10	16V	CEA 100P 16	
C27	Ceramic	12p	50V	CCDSL 120K 50	
C28	Ceramic	12p	50V	CCDSL 120K 50	
C29	Electrolytic	100	10V	CEA 101P 10	
C30	Electrolytic	100	10V	CEA 101P 10	
C31	Electrolytic	4.7	35V	CEA 4R7P 35	
C32	Electrolytic	4.7	35V	CEA 4R7P 35	
C33	Mylar	0.018	50V	CQMA 183J 50	
C34	Mylar	0.018	50V	CQMA 183J 50	
C35	Mylar	0.018	50V	CQMA 183J 50	
C36	Mylar	0.018	50V	CQMA 183J 50	
C37	Mylar	0.0022	50V	CQMA 222J 50	
C38	Mylar	0.0022	50V	CQMA 222J 50	
C39	Electrolytic	4.7	25V	CEANL 4R7P 25	
C40	Electrolytic	4.7	25V	CEANL 4R7P 25	
C41	Electrolytic	10	16V	CEA 100P 16	
C42	Electrolytic	10	16V	CEA 100P 16	
C43	Ceramic	12p	50V	CCDSL 120K 50	
C44	Ceramic	12p	50V	CCDSL 120K 50	
C45	Electrolytic	100	10V	CEA 101P 10	

Symbol	Description			Part No.	
C46	Electrolytic	100	10V	CEA 101P 10	
C47	Electrolytic	2.2	25V	CSSA 2R2M 25	
C48	Electrolytic	2.2	25V	CSSA 2R2M 25	
C49	Electrolytic	100	16V	CEA 101P 16	
C50	Electrolytic	100	16V	CEA 101P 16	
C51	Electrolytic	100	16V	CEA 101P 16	
C52	Electrolytic	100	16V	CEA 101P 16	
C53	Ceramic	470p	50V	CKDYB 471K 50	
C54	Ceramic	470p	50V	CKDYB 471K 50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	2.2k	RD¼PS 222J	
R2	Carbon film	2.2k	RD¼PS 222J	
R3	Carbon film	330k	RD¼PS 334J	
R4	Carbon film	330k	RD¼PS 334J	
R5	Carbon film	82k	RD¼PS 823J	
R6	Carbon film	82k	RD¼PS 823J	
R7	Carbon film	3.9k	RD¼PS 392J	
R8	Carbon film	3.9k	RD¼PS 392J	
R9	Carbon film	22k	RD¼PS 223J	
R10	Carbon film	22k	RD¼PS 223J	
R11	Carbon film	27k	RD¼PS 273J	
R12	Carbon film	27k	RD¼PS 273J	
R13	Carbon film	10k	RD¼PS 103J	
R14	Carbon film	10k	RD¼PS 103J	
R15	Carbon film	56	RD¼PS 560J	
R16	Carbon film	56	RD¼PS 560J	
R17	Carbon film	100k	RD¼PS 104J	
R18	Carbon film	100k	RD¼PS 104J	
R19	Carbon film	47k	RD¼PS 473J	
R20	Carbon film	47k	RD¼PS 473J	
R21	Carbon film	47k	RD¼PS 473J	
R22	Carbon film	47k	RD¼PS 473J	
R23	Carbon film	33k	RD¼PS 333J	
R24	Carbon film	33k	RD¼PS 333J	
R25	Carbon film	33k	RD¼PS 333J	
R26	Carbon film	33k	RD¼PS 333J	
R27	Carbon film	8.2k	RD¼PS 822J	
R28	Carbon film	8.2k	RD¼PS 822J	
R29	Carbon film	100k	RD¼PS 104J	
R30	Carbon film	100k	RD¼PS 104J	
R31	Carbon film	220k	RD¼PS 224J	
R32	Carbon film	220k	RD¼PS 224J	
R33	Carbon film	6.8k	RD¼PS 682J	
R34	Carbon film	6.8k	RD¼PS 682J	
R35	Carbon film	4.7k	RD¼PS 472J	

Continued on the Next Page

Symbol	Description	Part No.	
R36	Carbon film 4.7k	RD¼PS 472J	
R37	Carbon film 24k	RD¼PS 243J	
R38	Carbon film 24k	RD¼PS 243J	
R39	Carbon film 24k	RD¼PS 243J	
R40	Carbon film 24k	RD¼PS 243J	
R41	Carbon film 11k	RD¼PS 113J	
R42	Carbon film 11k	RD¼PS 113J	
R43	Carbon film 11k	RD¼PS 113J	
R44	Carbon film 11k	RD¼PS 113J	
R45	Carbon film 10k	RD¼PS 103J	
R46	Carbon film 10k	RD¼PS 103J	
R47	Carbon film 100k	RD¼PS 104J	
R48	Carbon film 100k	RD¼PS 104J	
R49	Carbon film 220k	RD¼PS 224J	
R50	Carbon film 220k	RD¼PS 224J	
R51	Carbon film 6.8k	RD¼PS 682J	
R52	Carbon film 6.8k	RD¼PS 682J	
R53	Carbon film 4.7k	RD¼PS 472J	
R54	Carbon film 4.7k	RD¼PS 472J	
R55	Carbon film 100k	RD¼PS 104J	
R56	Carbon film 100k	RD¼PS 104J	
R57	Carbon film 1k	RD¼PS 102J	
R58	Carbon film 1k	RD¼PS 102J	
R59	Carbon film 2.2k	RD¼PS 222J	
R60	Carbon film 2.2k	RD¼PS 222J	
R61	Carbon film 2.2k	RD¼PS 222J	
R62	Carbon film 2.2k	RD¼PS 222J	

POTENTIOMETERS

Symbol	Description	Part No.	
VR1	Variable resistor (Bass-sub)	ACV-132-0	
VR2	Variable resistor (Bass-main)	ACV-130-0	
VR3	Variable resistor (Treble-sub)	ACV-133-0	
VR4	Variable resistor (Treble-main)	ACV-131-0	

SEMICONDUCTORS

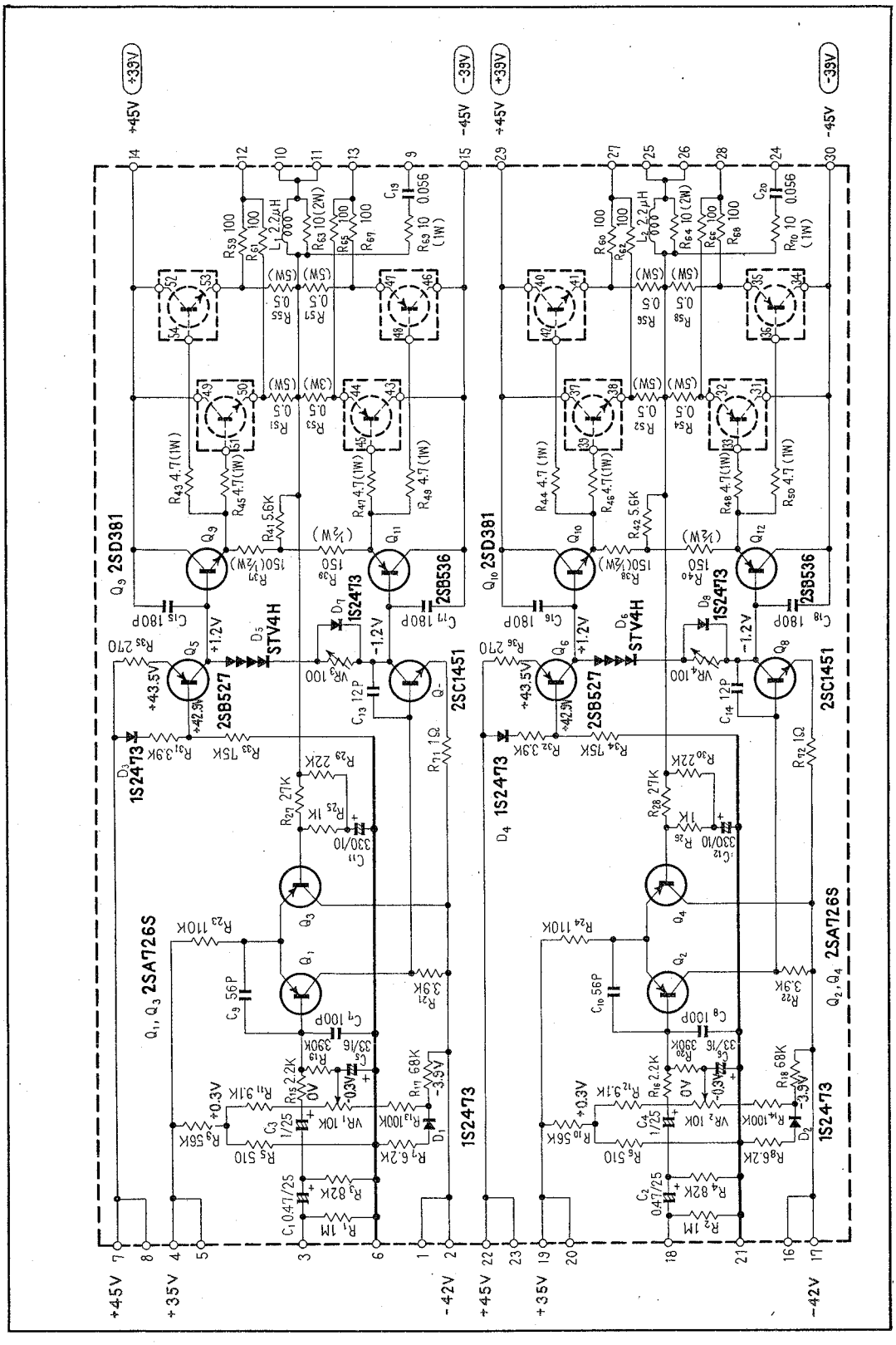
Symbol	Description	Part No.	
Q1	Transistor 2SA725-F or G (2SA763P-5 or 6) (2SA640-K or L)		
Q2	Transistor 2SA725-F or G (2SA763P-5 or 6) (2SA640-K or L)		
Q3	Transistor 2SC1312-G or H (2SC1344-D or E) (2SC900-E or F)		
Q4	Transistor 2SC1312-G or H (2SC1344-D or E) (2SC900-E or F)		
Q5	Transistor 2SC1312-G or H (2SC1344-D or E) (2SC900-E or F)		

Symbol	Description	Part No.	
Q6	Transistor 2SC1312-G or H (2SC1344-D or E) (2SC900-E or F)		
Q7	Transistor 2SC1312-G or H (2SC1344-D or E) (2SC900-E or F)		
Q8	Transistor 2SC1312-G or H (2SC1344-D or E) (2SC900-E or F)		

SWITCH

Symbol	Description	Part No.	
S1	Lever switch (Tone)	ASK-070-0	

12. 6 POWER AMPLIFIER ASSEMBLY (AWH-030-0)



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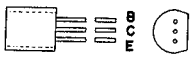
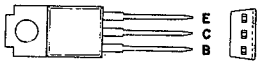
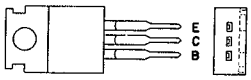


2SB527

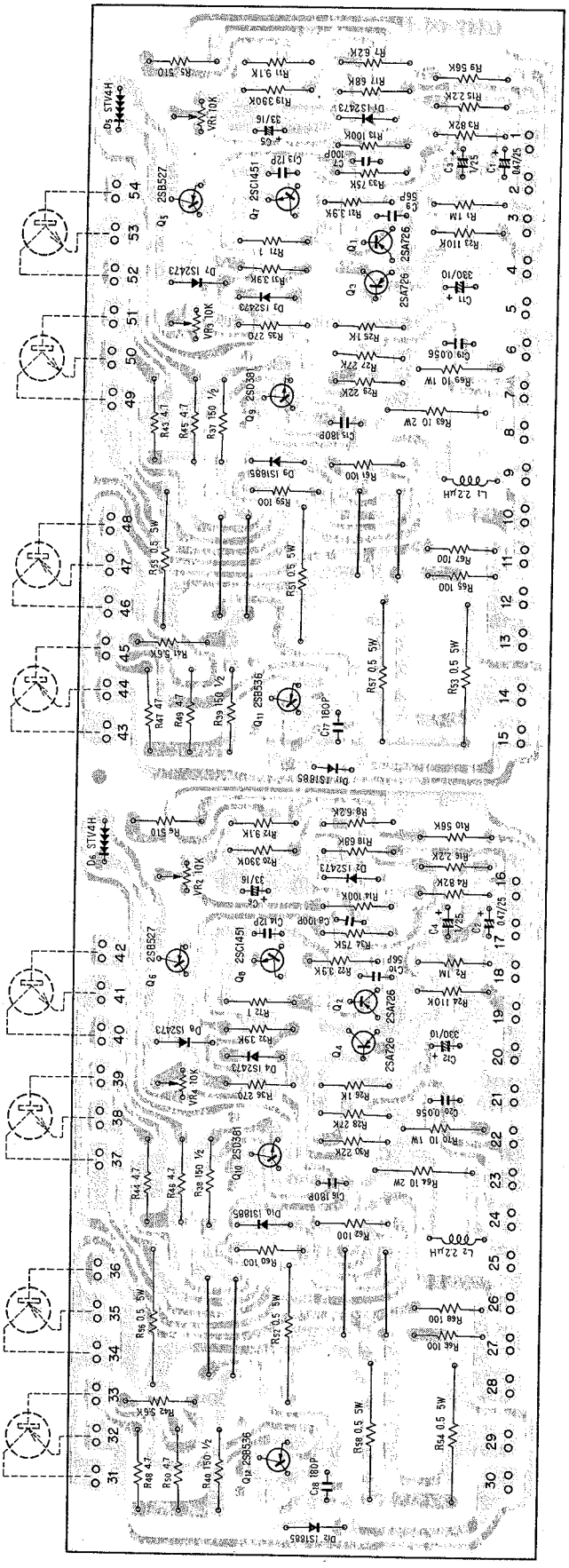


2SC1451

2SB536
2SD381



Foil Side



Parts List of Power Amplifier Assembly (AWH-030-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.47	25V	CSSA R47P 25	
C2	Electrolytic	0.47	25V	CSSA R47P 25	
C3	Electrolytic	1	25V	CSSA 010P 25	
C4	Electrolytic	1	25V	CSSA 010P 25	
C5	Electrolytic	33	16V	CEA 330P 16	
C6	Electrolytic	33	16V	CEA 330P 16	
C7	Ceramic	100p	50V	CCDSL 101K 50	
C8	Ceramic	100p	50V	CCDSL 101K 50	
C9	Ceramic	56p	50V	CCDSL 560K 50	
C10	Ceramic	56p	50V	CCDSL 560K 50	
C11	Electrolytic	330	10V	CEA 331P 10	
C12	Electrolytic	330	10V	CEA 331P 10	
C13	Ceramic	12p	500V	CCDSL 120K 500	
C14	Ceramic	12p	500V	CCDSL 120K 500	
C15	Ceramic	180p	500V	CCDSL 181K 500	
C16	Ceramic	180p	500V	CCDSL 181K 500	
C17	Ceramic	180p	500V	CCDSL 181K 500	
C18	Ceramic	180p	500V	CCDSL 181K 500	
C19	Mylar	0.056	50V	CQMA 563M 50	
C20	Mylar	0.056	50V	CQMA 563M 50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	1M	RD¼PS 105J	
R2	Carbon film	1M	RD¼PS 105J	
R3	Carbon film	82k	RD¼PS 823J	
R4	Carbon film	82k	RD¼PS 823J	
R5	Carbon film	510	RD¼PS 511J	
R6	Carbon film	510	RD¼PS 511J	
R7	Carbon film	6.2k	RD¼PS 622J	
R8	Carbon film	6.2k	RD¼PS 622J	
R9	Carbon film	56k	RD¼PS 563J	
R10	Carbon film	56k	RD¼PS 563J	
R11	Carbon film	9.1k	RD¼PS 912J	
R12	Carbon film	9.1k	RD¼PS 912J	
R13	Carbon film	100k	RD¼PS 104J	
R14	Carbon film	100k	RD¼PS 104J	
R15	Carbon film	2.2k	RD¼PS 222J	
R16	Carbon film	2.2k	RD¼PS 222J	
R17	Carbon film	68k	RD¼PS 683J	
R18	Carbon film	68k	RD¼PS 683J	
R19	Carbon film	390k	RD¼PS 394J	
R20	Carbon film	390k	RD¼PS 394J	
R21	Carbon film	3.9k	RD¼PS 392J	
R22	Carbon film	3.9k	RD¼PS 392J	
R23	Carbon film	110k	RD¼PS 114J	
R24	Carbon film	110k	RD¼PS 114J	
R25	Carbon film	1k	RD¼PS 102J	

Symbol	Description			Part No.	
R26	Carbon film	1k		RD¼PS 102J	
R27	Carbon film	27k		RD¼PS 273J	
R28	Carbon film	27k		RD¼PS 273J	
R29	Carbon film	22k		RD¼PS 223J	
R30	Carbon film	22k		RD¼PS 223J	
R31	Carbon film	3.9k		RD¼PS 392J	
R32	Carbon film	3.9k		RD¼PS 392J	
R33	Carbon film	75k		RD¼PS 753J	
R34	Carbon film	75k		RD¼PS 753J	
R35	Carbon film	270		RD¼PS 271J	
R36	Carbon film	270		RD¼PS 271J	
R37	Carbon film	150	½W	RD½PS 151J	
R38	Carbon film	150	½W	RD½PS 151J	
R39	Carbon film	150	½W	RD½PS 151J	
R40	Carbon film	150	½W	RD½PS 151J	
R41	Carbon film	5.6k		RD¼PS 562J	
R42	Carbon film	5.6k		RD¼PS 562J	
R43	Metal film	4.7	1W	RN1H 4R7K	
R44	Metal film	4.7	1W	RN1H 4R7K	
R45	Metal film	4.7	1W	RN1H 4R7K	
R46	Metal film	4.7	1W	RN1H 4R7K	
R47	Metal film	4.7	1W	RN1H 4R7K	
R48	Metal film	4.7	1W	RN1H 4R7K	
R49	Metal film	4.7	1W	RN1H 4R7K	
R50	Metal film	4.7	1W	RN1H 4R7K	
R51	Wire wound	0.5	5W	RT5B 0R5K	
R52	Wire wound	0.5	5W	RT5B 0R5K	
R53	Wire wound	0.5	5W	RT5B 0R5K	
R54	Wire wound	0.5	5W	RT5B 0R5K	
R55	Wire wound	0.5	5W	RT5B 0R5K	
R56	Wire wound	0.5	5W	RT5B 0R5K	
R57	Wire wound	0.5	5W	RT5B 0R5K	
R58	Wire wound	0.5	5W	RT5B 0R5K	
R59	Carbon film	100		RD¼PS 101J	
R60	Carbon film	100		RD¼PS 101J	
R61	Carbon film	100		RD¼PS 101J	
R62	Carbon film	100		RD¼PS 101J	
R63	Metal oxide	10	2W	RS2P 100J	
R64	Metal oxide	10	2W	RS2P 100J	
R65	Carbon film	100		RD¼PS 101J	
R66	Carbon film	100		RD¼PS 101J	
R67	Carbon film	100		RD¼PS 101J	
R68	Carbon film	100		RD¼PS 101J	
R69	Metal oxide	10	1W	RS1P 100J	
R70	Metal oxide	10	1W	RS1P 100J	
R71	Carbon film	1		RD¼PS 010J	
R72	Carbon film	1		RD¼PS 010J	

Continued on the Next Page

POTENTIOMETERS

Symbol	Description	Part No.	
VR1	Variable resistor 10k-B, semi-fixed	ACP-029-0	
VR2	Variable resistor 10k-B, semi-fixed	ACP-029-0	
VR3	Variable resistor 100-B, semi-fixed	ACP-019-A	
VR4	Variable resistor 100-B, semi-fixed	ACP-019-A	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SA726S-F or G		
Q2	Transistor	2SA726S-F or G		
Q3	Transistor	2SA726S-F or G		
Q4	Transistor	2SA726S-F or G		
Q5	Transistor	2SB527-C or D		
Q6	Transistor	2SB527-C or D		
Q7	Transistor	2SC1451-V or B		
Q8	Transistor	2SC1451-V or B		
Q9	Transistor	2SD381-M or L		
Q10	Transistor	2SD381-M or L		
Q11	Transistor	2SB536-M or L		
Q12	Transistor	2SB536-M or L		
D1	Diode	1S2473		
D2	Diode	1S2473		
D3	Diode	1S2473		
D4	Diode	1S2473		
D5	Varistor	STV4H		
D6	Varistor	STV4H		
D7	Diode	1S2473		
D8	Diode	1S2473		

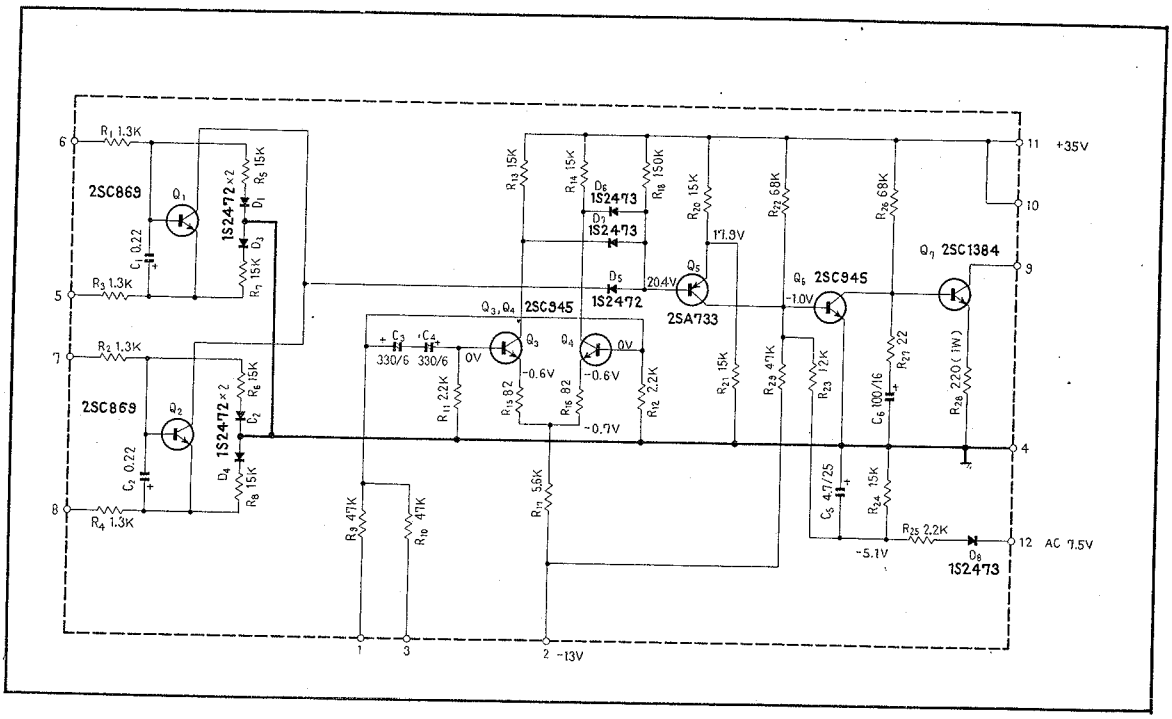
COILS

Symbol	Description	Part No.	
L1	AF choke coil	T63-009-0	
L2	AF choke coil	T63-009-0	

OTHERS

Symbol	Description	Part No.	
	Heat sink	ANH-203-0	

12. 7 PROTECTION CIRCUIT ASSEMBLY (AWM-062-0)



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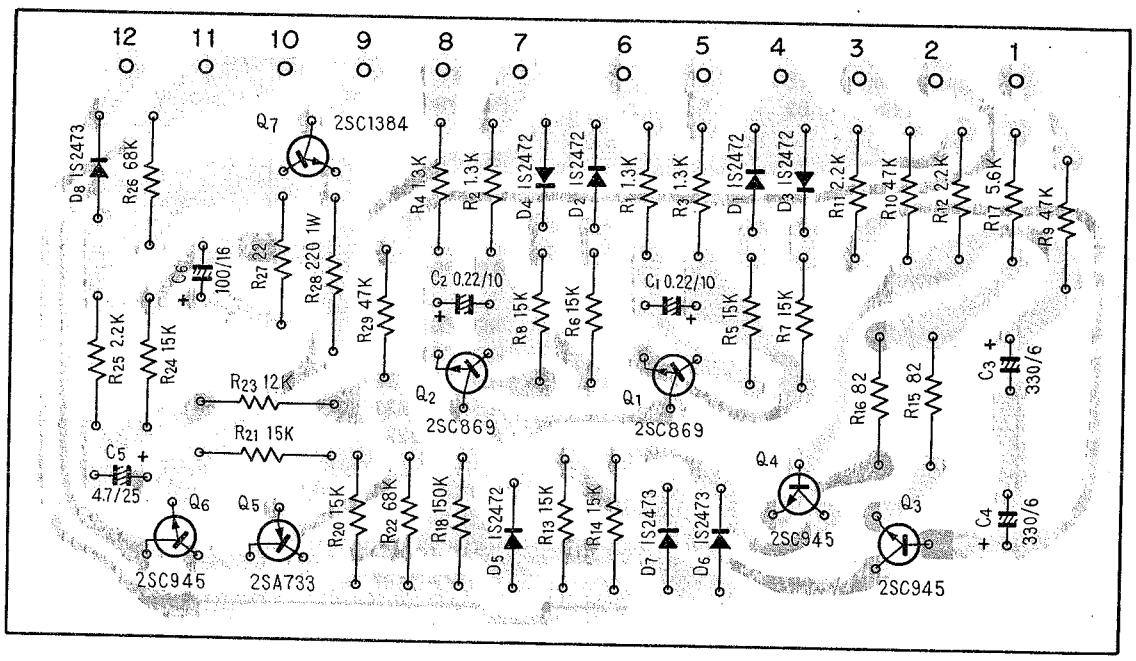
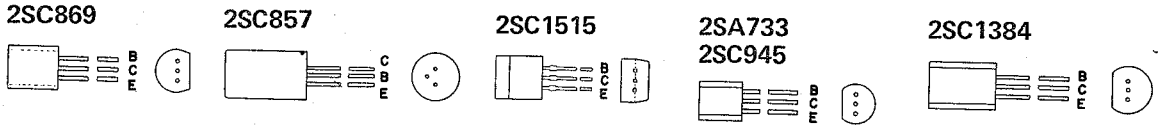




Parts List of Protection Circuit Assembly (AWM-062-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.22	10V	CSSA R22M 10	
C2	Electrolytic	0.22	10V	CSSA R22M 10	
C3	Electrolytic	330	6V	CEA 331P 6	
C4	Electrolytic	330	6V	CEA 331P 6	
C5	Electrolytic	4.7	25V	CEA 4R7P 25	
C6	Electrolytic	100	16V	CEA 101P 16	

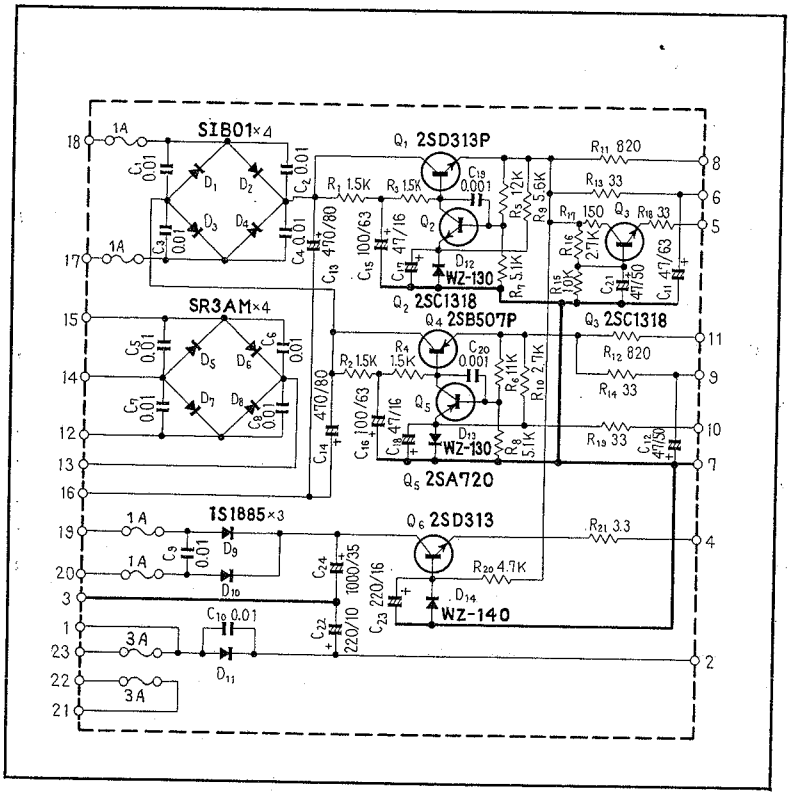
RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	1.3k		RD¼PS 132J	
R2	Carbon film	1.3k		RD¼PS 132J	
R3	Carbon film	1.3k		RD¼PS 132J	
R4	Carbon film	1.3k		RD¼PS 132J	
R5	Carbon film	15k		RD¼PS 153J	
R6	Carbon film	15k		RD¼PS 153J	
R7	Carbon film	15k		RD¼PS 153J	
R8	Carbon film	15k		RD¼PS 153J	
R9	Carbon film	47k		RD¼PS 473J	
R10	Carbon film	47k		RD¼PS 473J	
R11	Carbon film	2.2k		RD¼PS 222J	
R12	Carbon film	2.2k		RD¼PS 222J	
R13	Carbon film	15k		RD¼PS 153J	
R14	Carbon film	15k		RD¼PS 153J	
R15	Carbon film	82		RD¼PS 820J	
R16	Carbon film	82		RD¼PS 820J	
R17	Carbon film	5.6k		RD¼PS 562J	
R18	Carbon film	150k		RD¼PS 154J	
R19					
R20	Carbon film	15k		RD¼PS 153J	
R21	Carbon film	15k		RD¼PS 153J	
R22	Carbon film	68k		RD¼PS 683J	
R23	Carbon film	12k		RD¼PS 123J	
R24	Carbon film	15k		RD¼PS 153J	
R25	Carbon film	2.2k		RD¼PS 222J	
R26	Carbon film	68k		RD¼PS 683J	
R27	Carbon film	22		RD¼PS 220J	
R28	Metal oxide	220	1W	RS1P 221J	
R29	Carbon film	47k		RD¼PS 473J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SC869-C, B or D (2SC857-K or A) (2SC1515-K)		
Q2	Transistor	2SC869-C, B or D (2SC857-K or A) (2SC1515-K)		
Q3	Transistor	2SC945-Q or R		
Q4	Transistor	2SC945-Q or R		
Q5	Transistor	2SA733-Q or R		
Q6	Transistor	2SC945-Q or R		
Q7	Transistor	2SC1384-R or Q		
D1	Diode	1S2472		
D2	Diode	1S2472		
D3	Diode	1S2472		
D4	Diode	1S2472		
D5	Diode	1S2472		
D6	Diode	1S2473		
D7	Diode	1S2473		
D8	Diode	1S2473		

12. 8 POWER SUPPLY CIRCUIT ASSEMBLY (AWR-052-0)



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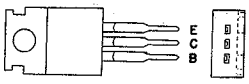
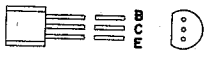
2SD313P
2SB507P



2SA720
2SC1318



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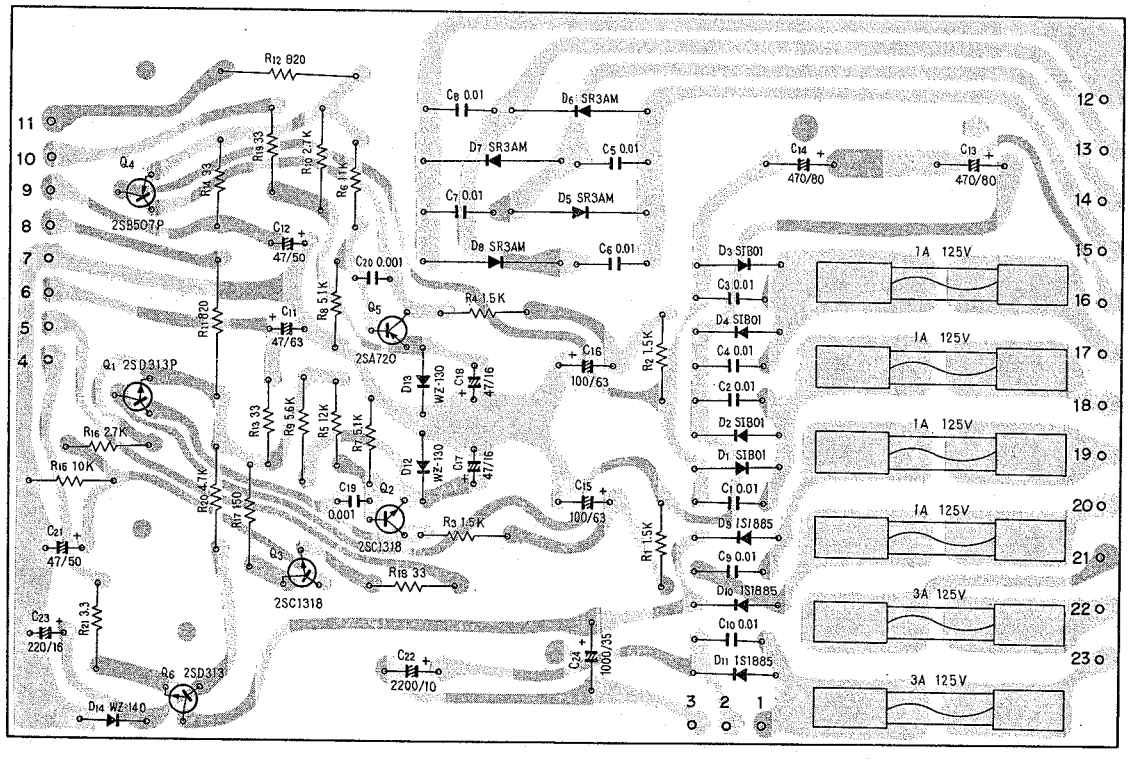


Parts List of Power Supply Circuit Assembly (AWR-052-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	150V	ACG-004-0	
C2	Ceramic	0.01	150V	ACG-004-0	
C3	Ceramic	0.01	150V	ACG-004-0	
C4	Ceramic	0.01	150V	ACG-004-0	
C5	Ceramic	0.01	150V	ACG-004-0	
C6	Ceramic	0.01	150V	ACG-004-0	
C7	Ceramic	0.01	150V	ACG-004-0	
C8	Ceramic	0.01	150V	ACG-004-0	
C9	Ceramic	0.01	150V	ACG-004-0	
C10	Ceramic	0.01	150V	ACG-004-0	
C11	Electrolytic	47	63V	CEA 470P 63	
C12	Electrolytic	47	50V	CEA 470P 50	
C13	Electrolytic	470	80V	ACH-038-0	
C14	Electrolytic	470	80V	ACH-038-0	
C15	Electrolytic	100	63V	CEA 101P 63	
C16	Electrolytic	100	63V	CEA 101P 63	
C17	Electrolytic	47	16V	CEA 470P 16	
C18	Electrolytic	47	16V	CEA 470P 16	
C19	Ceramic	0.001	50V	CKDYF 102Z 50	
C20	Ceramic	0.001	50V	CKDYF 102Z 50	
C21	Electrolytic	47	50V	CEA 470P 50	
C22	Electrolytic	2,200	10V	CEA 222P 10	
C23	Electrolytic	220	16V	CEA 221P 16	
C24	Electrolytic	1,000	35V	ACH-039-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	1.5k		RD¼PS 152J	
R2	Carbon film	1.5k		RD¼PS 152J	
R3	Carbon film	1.5k		RD¼PS 152J	
R4	Carbon film	1.5k		RD¼PS 152J	
R5	Carbon film	12k		RD¼PS 123J	
R6	Carbon film	11k		RD¼PS 113J	
R7	Carbon film	5.1k		RD¼PS 512J	
R8	Carbon film	5.1k		RD¼PS 512J	
R9	Carbon film	5.6k	½W	RD½PS 562J	
R10	Metal oxide	2.7k	1W	RS1P 272J	
R11	Metal oxide	820	2W	RS2P 821J	
R12	Metal oxide	820	2W	RS2P 821J	
R13	Carbon film	33		RD¼PS 330J	
R14	Carbon film	33		RD¼PS 330J	
R15	Carbon film	10k		RD¼PS 103J	
R16	Carbon film	2.7k		RD¼PS 272J	
R17	Carbon film	150	½W	RD½PS 151J	
R18	Carbon film	33		RD¼PS 330J	
R19	Carbon film	33		RD¼PS 330J	
R20	Carbon film	4.7k	½W	RD½PS 472J	
R21	Carbon film	3.3		RD¼PS 3R3J	

Continued on the Next Page

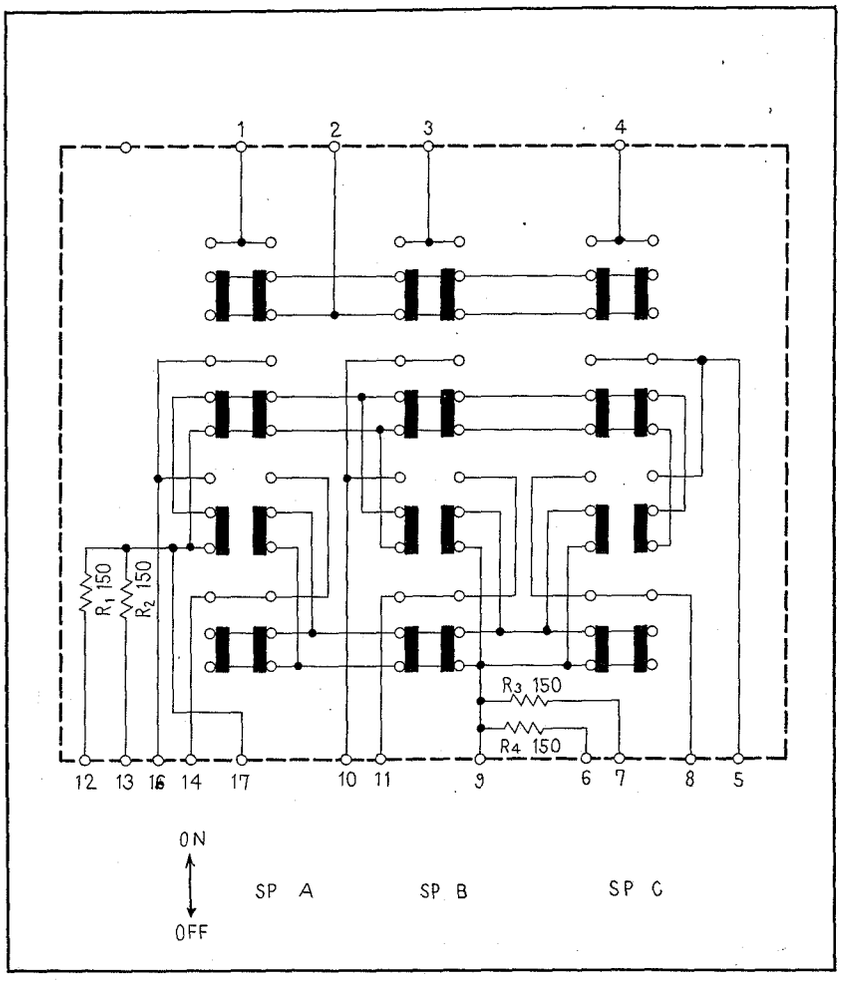
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SD313P-E or D		
Q2	Transistor	2SC1318-Q or R		
Q3	Transistor	2SC1318-Q or R		
Q4	Transistor	2SB507P-E or D		
Q5	Transistor	2SA720-Q or R		
Q6	Transistor	2SD313-E or D		
D1	Diode	SIB01-04		
D2	Diode	SIB01-04		
D3	Diode	SIB01-04		
D4	Diode	SIB01-04		
D5	Diode	SR3AM-8		
D6	Diode	SR3AM-8		
D7	Diode	SR3AM-8		
D8	Diode	SR3AM-8		
D9	Diode	1S1885 (SIB01-01)		
D10	Diode	1S1885 (SIB01-01)		
D11	Diode	1S1885 (SIB01-01)		
D12	Zener diode	WZ-130		
D13	Zener diode	WZ-130		
D14	Zener diode	WZ-140		

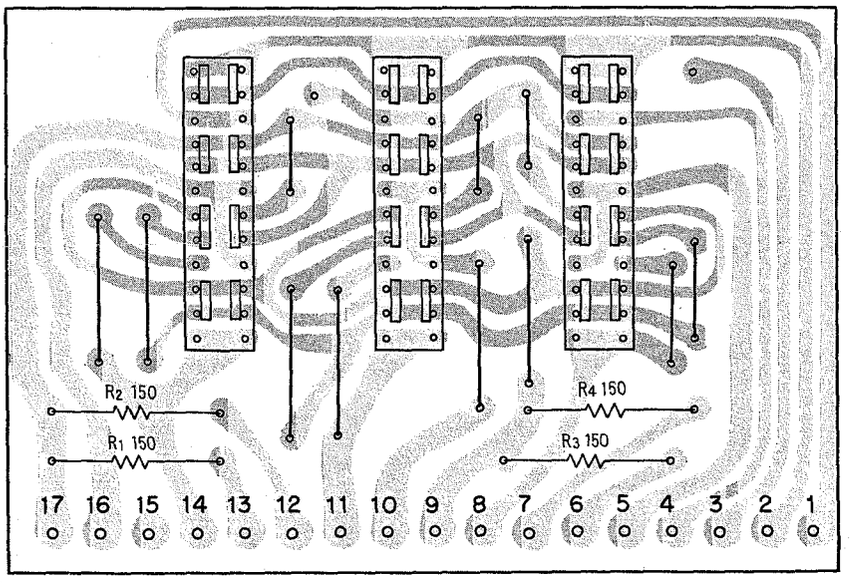
OTHERS

Symbol	Description	Part No.	
	Heat sink	ANH-117-0	
	Heat sink (small)	ANH-207-A	
	Socket (transistor)	AKH-002-0	
	Spacer (insulator)	AEC-043-0	
	Fuse holder	AKR-013-0	

12. 9 SWITCH CIRCUIT ASSEMBLY (AWS-064-0)



Foil Side



Parts List of Switch Circuit Assembly (AWS-064-0)

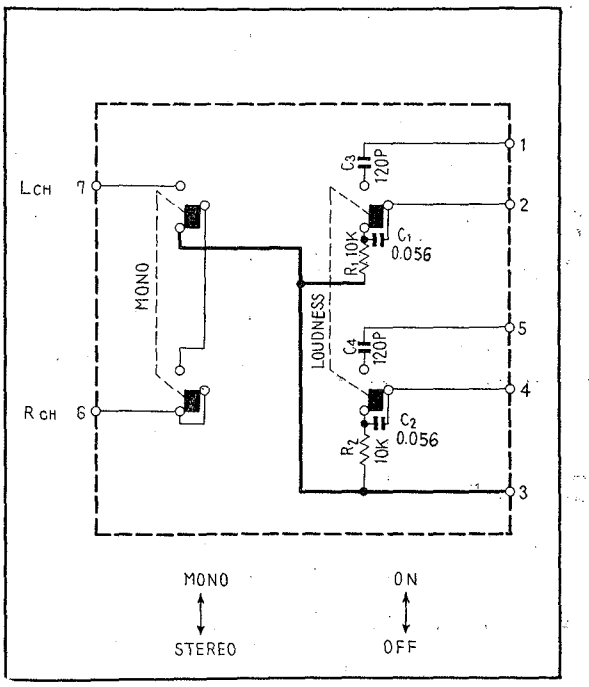
RESISTORS

Symbol	Description	Part No.	
R1	Metal oxide 150 2W	RS2PF 151J	
R2	Metal oxide 150 2W	RS2PF 151J	
R3	Metal oxide 150 2W	RS2PF 151J	
R4	Metal oxide 150 2W	RS2PF 151J	

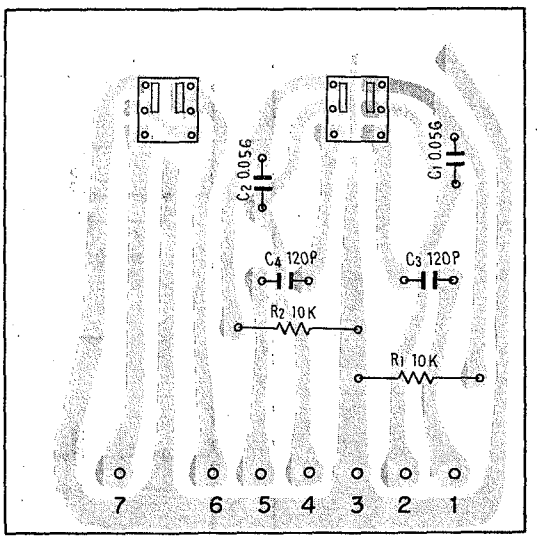
SWITCH

Symbol	Description	Part No.	
	Push switch (speakers)	ASG-061-0	

12.10 SWITCH CIRCUIT ASSEMBLY (AWS-065-0)



Foil Side



CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.056	50V	CQMA 563J 50	
C2	Mylar	0.056	50V	CQMA 563J 50	
C3	Ceramic	120p	50V	CCDSL 121K 50	
C4	Ceramic	120p	50V	CCDSL 121K 50	

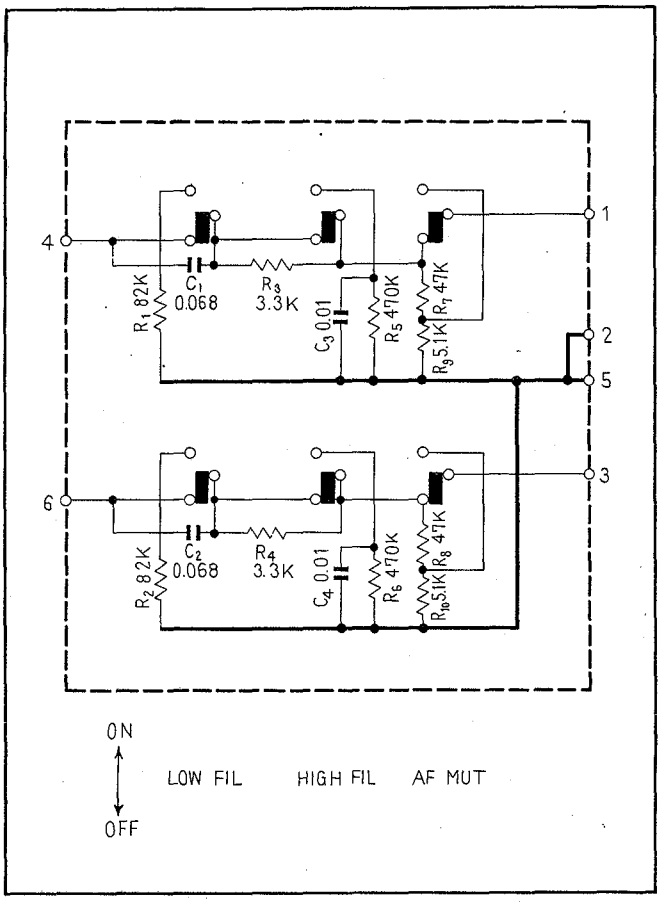
RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	10k	RD¼PS 103J	
R2	Carbon film	10k	RD¼PS 103J	

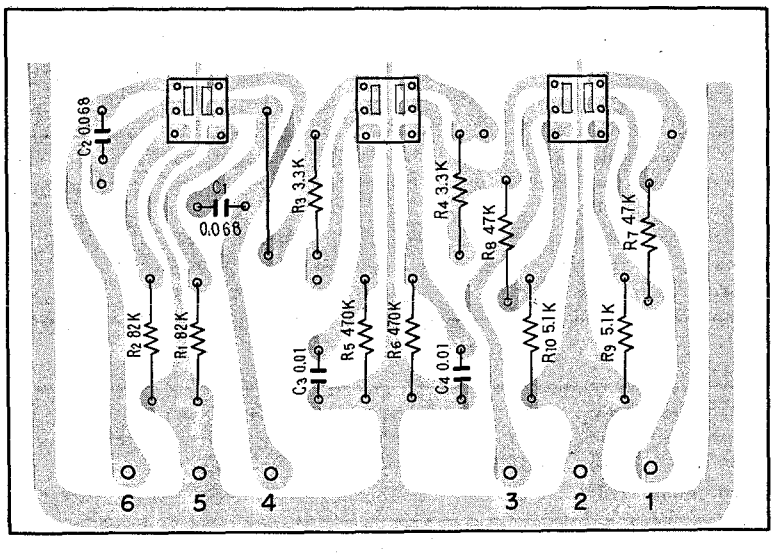
SWITCH

Symbol	Description	Part No.	
	Push switch (mode, loudness)	ASG-063-0	

12.11 SWITCH CIRCUIT ASSEMBLY (AWS-066-0)



Foil Side



Parts List of Switch Circuit Assembly (AWS-066-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.068	50V	CQMA 683K 50	
C2	Mylar	0.068	50V	CQMA 683K 50	
C3	Mylar	0.01	50V	CQMA 103K 50	
C4	Mylar	0.01	50V	CQMA 103K 50	

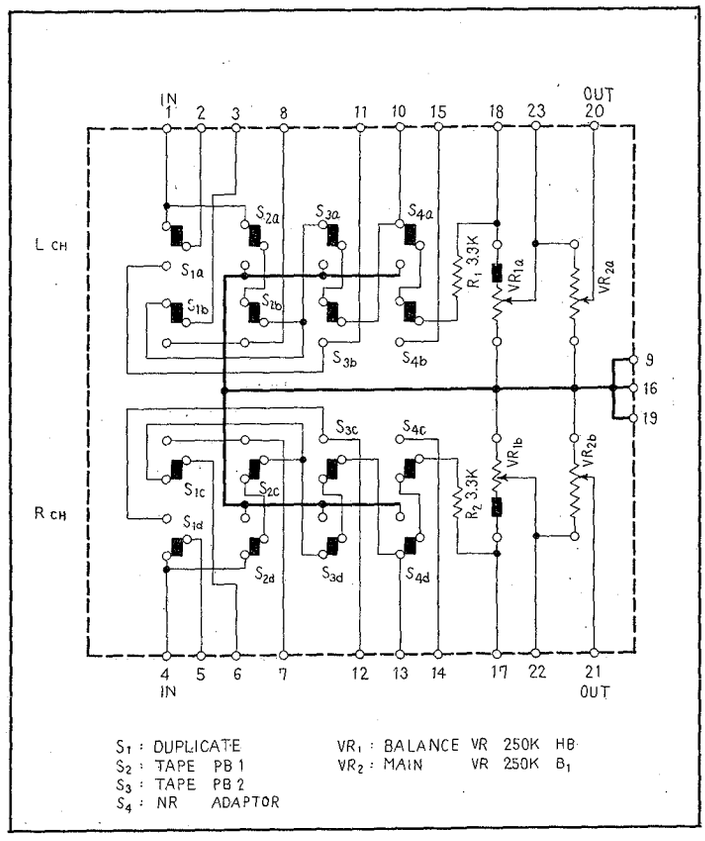
RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	82k	RD¼PM 823J	
R2	Carbon film	82k	RD¼PM 823J	
R3	Carbon film	3.3k	RD¼PM 332J	
R4	Carbon film	3.3k	RD¼PM 332J	
R5	Carbon film	470k	RD¼PM 474J	
R6	Carbon film	470k	RD¼PM 474J	
R7	Carbon film	47k	RD¼PM 473J	
R8	Carbon film	47k	RD¼PM 473J	
R9	Carbon film	5.1k	RD¼PM 512J	
R10	Carbon film	5.1k	RD¼PM 512J	

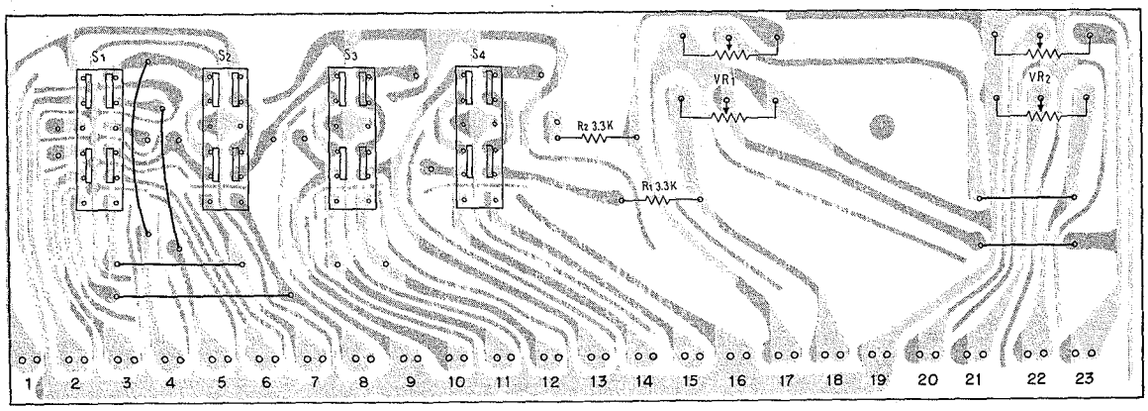
SWITCH

Symbol	Description	Part No.	
	Mini switch (filters, AF muting)	ASG-062-0	

12.12 SWITCH CIRCUIT ASSEMBLY (AWS-067-0)



Foil Side



Parts List of Switch Circuit Assembly (AWS-067-0)

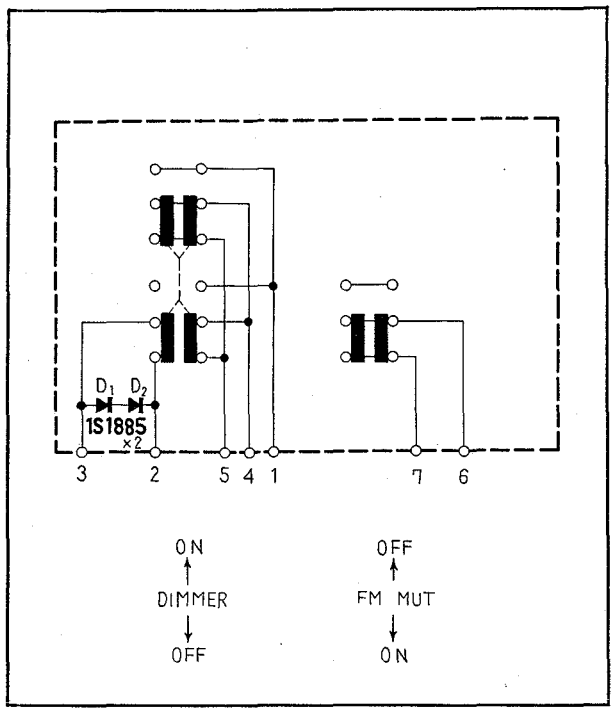
RESISTORS AND POTENTIOMETERS

Symbol	Description	Part No.	
R1	Carbon film 3.3k	RD¼PS 332J	
R2	Carbon film 3.3k	RD¼PS 332J	
VR1	Variable resistor 250k-HB (Balance)	ACV-135-0	
VR2	Variable resistor 250k-B1 (Volume)	ACV-134-0	

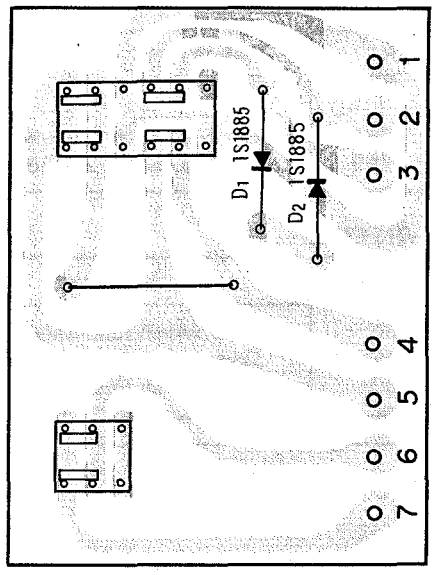
SWITCHES

Symbol	Description	Part No.	
S1	Lever switch (duplicate)	ASK-072-0	
S2	Lever switch (monitor-1)	ASK-072-0	
S3	Lever switch (monitor-2)	ASK-072-0	
S4	Lever switch (NR adaptor)	ASK-072-0	

12.13 SWITCH CIRCUIT ASSEMBLY (AWS-068-0)



Foil Side



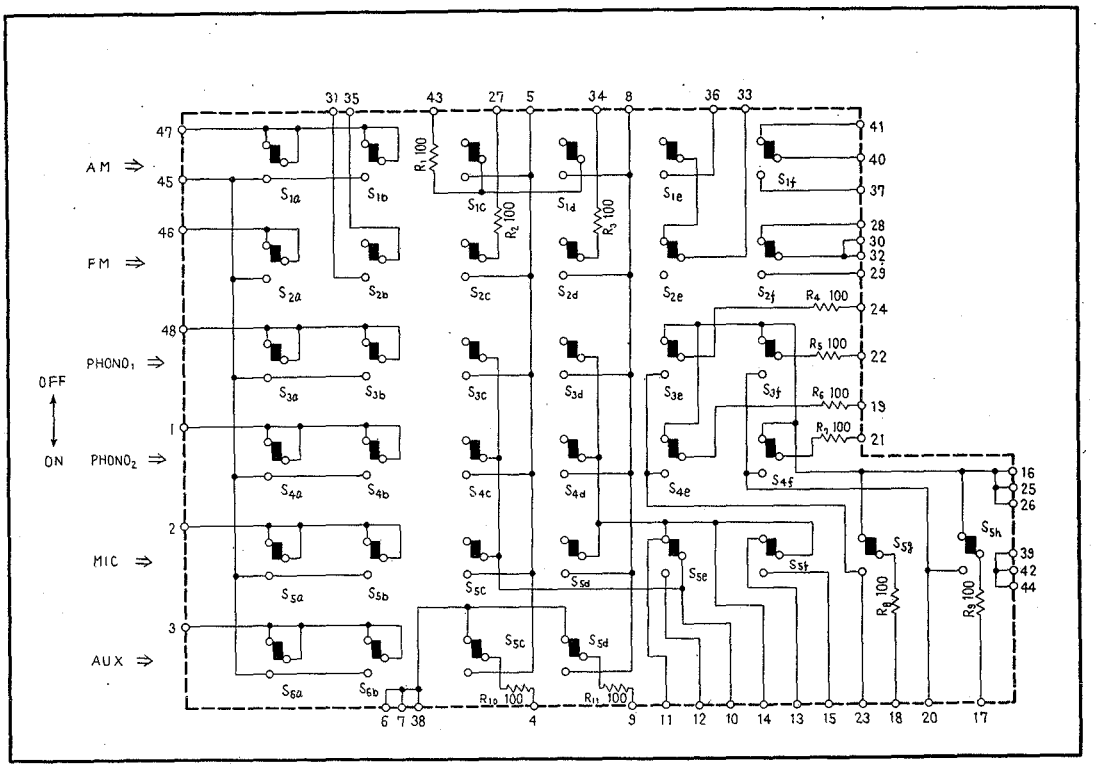
SEMICONDUCTORS

Symbol	Description	Part No.	
D1	Diode 1S1885 or SIB01-01		
D2	Diode 1S1885 or SIB01-01		

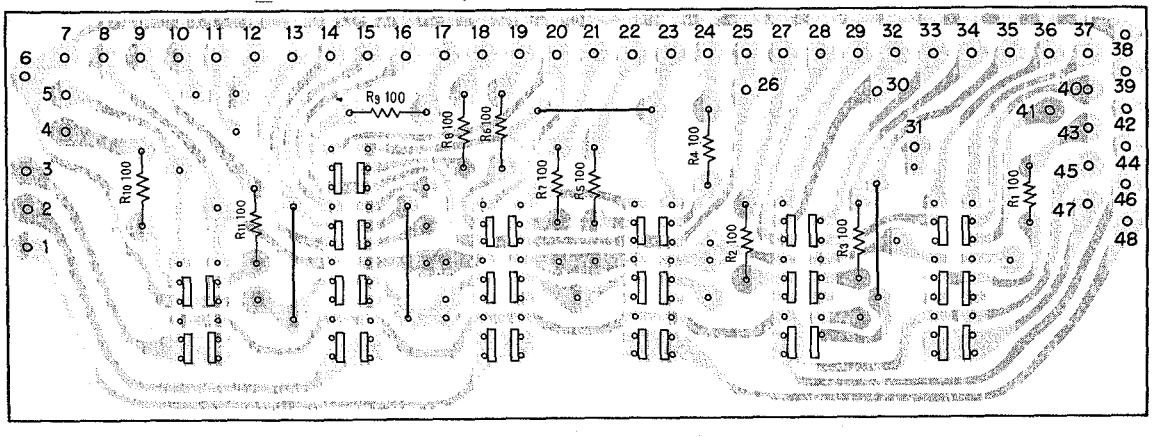
SWITCH

Symbol	Description	Part No.	
	Push switch (dimmer, FM muting)	ASG-064-0	

12.14 SWITCH CIRCUIT ASSEMBLY (AWS-069-0)



Foil Side



Parts List of Switch Circuit Assembly (AWS-069-0)

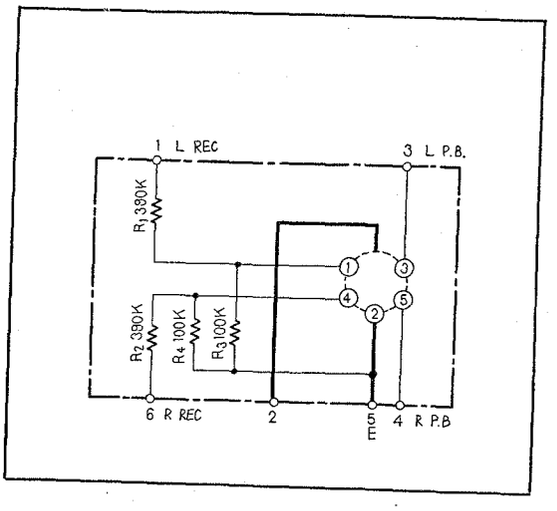
RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 100	RD¼PM 101J	
R2	Carbon film 100	RD¼PM 101J	
R3	Carbon film 100	RD¼PM 101J	
R4	Carbon film 100	RD¼PM 101J	
R5	Carbon film 100	RD¼PM 101J	
R6	Carbon film 100	RD¼PM 101J	
R7	Carbon film 100	RD¼PM 101J	
R8	Carbon film 100	RD¼PM 101J	
R9	Carbon film 100	RD¼PM 101J	
R10	Carbon film 100	RD¼PM 101J	
R11	Carbon film 100	RD¼PM 101J	

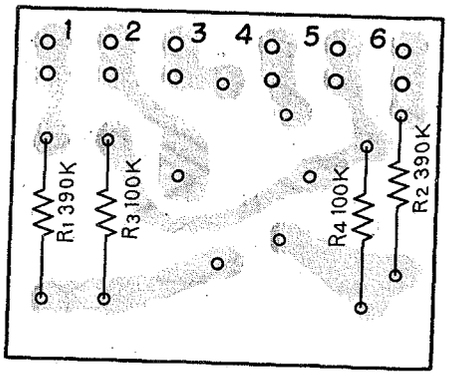
SWITCH

Symbol	Description	Part No.	
	Push switch (function)	ASG-065-0	

12.15 5P CONNECTOR ASSEMBLY (AWX-062-0)



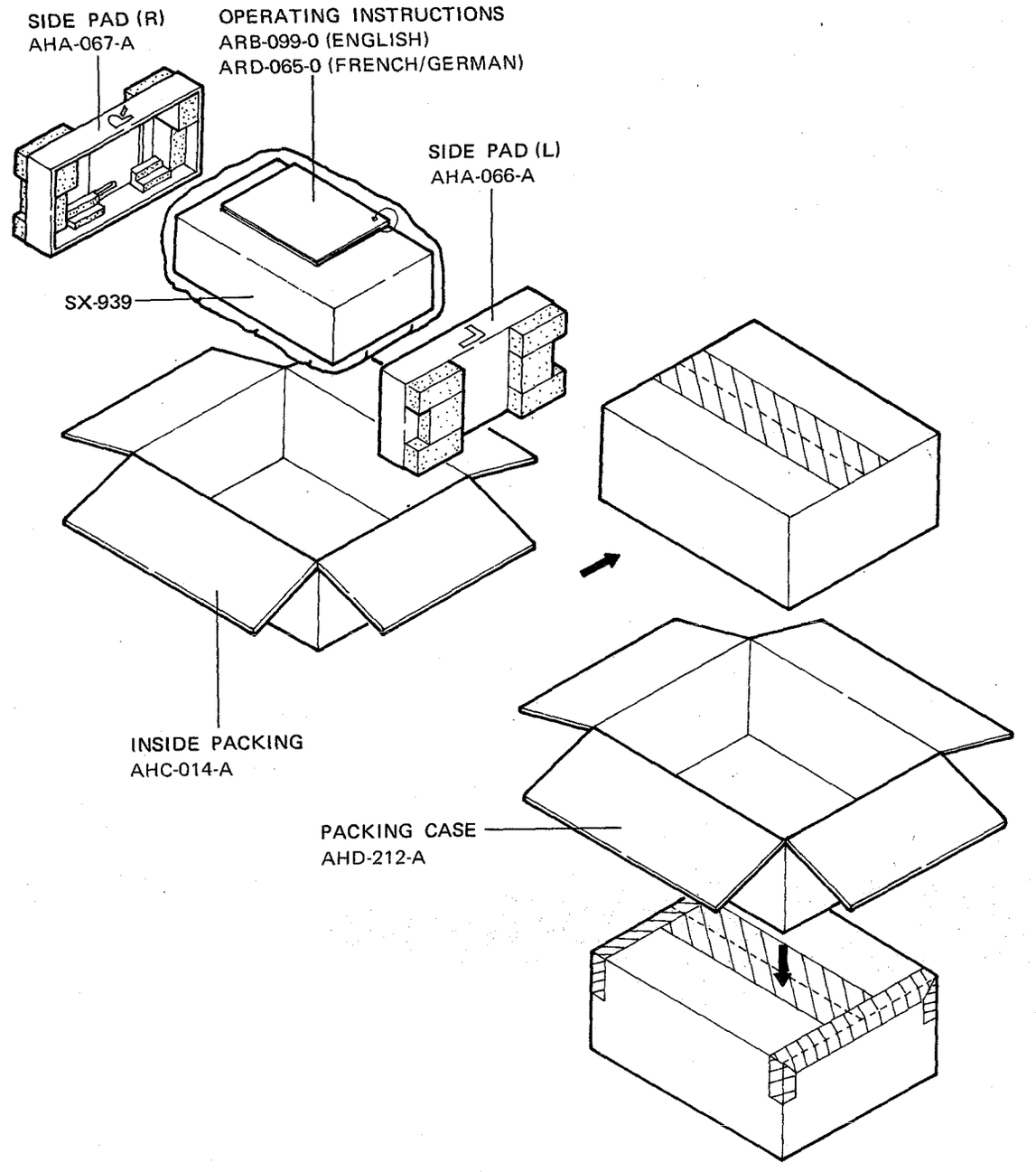
Foil Side



RESISTORS AND OTHER

Symbol	Description	Part No.	
R1	Carbon film 390k	RD¼PS 394J	
R2	Carbon film 390k	RD¼PS 394J	
R3	Carbon film 100k	RD¼PS 104J	
R4	Carbon film 100k	RD¼PS 104J	
	Connector (DIN type 5P)	AKP-007-0	

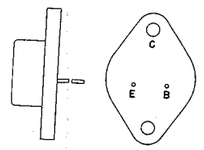
13. PACKING METHOD AND PART NUMBERS

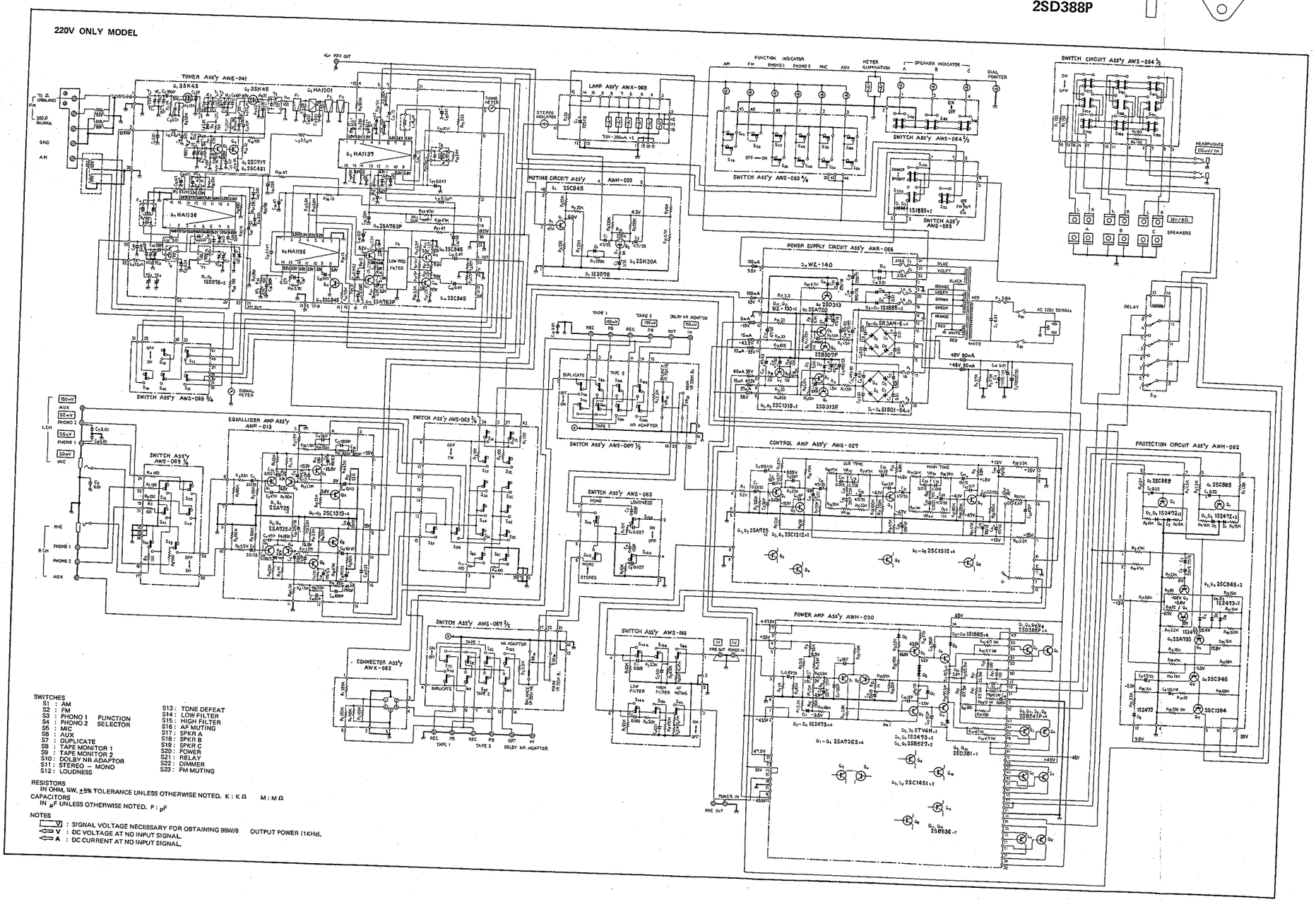


14. SCHEMATIC DIAGRAMS, P. C. BOARD PATTERN AND PARTS LIST FOR 220V ONLY MODEL

14.1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS

2SA745A
2SB503S
2SB541P
2SC1403A
2SD370S
2SD388P





- CAPACITORS: IN μF UNLESS OTHERWISE NOTED p: pF.
- RESISTORS: IN Ω , ¼W UNLESS OTHERWISE NOTED k: kΩ , M: MΩ .

Miscellaneous Parts (220V only model)

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	250V	ACG-001-0	
C2	Ceramic	0.01	150V	ACG-004-0	
C3	Electrolytic	10,000	50V	ACH-019-0	
C4	Electrolytic	10,000	50V	ACH-019-0	
C5					
C6					
C7	Ceramic	0.01	50V	CKDYF 103Z 50	
C8	Ceramic	0.01	50V	CKDYF 103Z 50	
C9	Ceramic	0.01	50V	CKDYF 103Z 50	
C10	Ceramic	0.01	50V	CKDYF 103Z 50	

RESISTORS

Symbol	Description			Part No.	
R1	Metal oxide	2.7k	2W	RS2P 272J	
R2	Metal oxide	2.7k	2W	RS2P 272J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		
Q2	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		
Q3	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q4	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q5	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q6	Transistor	2SB541P-L or M (2SA745A-R, O or Y) (2SB530S-R, O or Y)		
Q7	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		
Q8	Transistor	2SD388P-L or M (2SC1403A-R, O or Y) (2SD370S-R, O or Y)		

SWITCHES

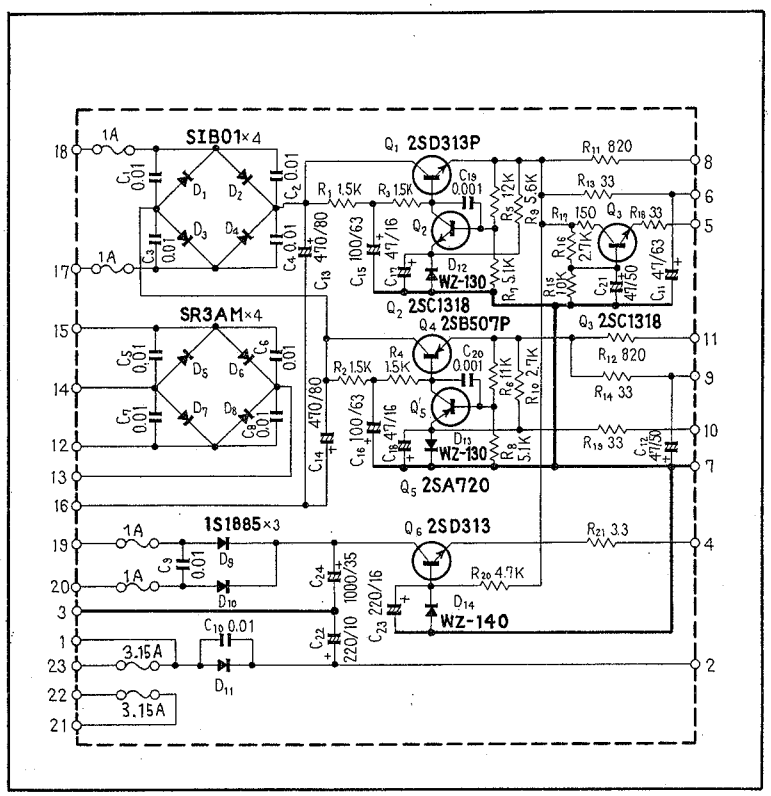
Symbol	Description	Part No.	
S20	Lever switch (Power)	ASK-068-0	
S21	Relay	ASR-007-0	

OTHERS

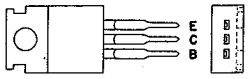
Symbol	Description	Part No.	
	Tuner assembly	AWE-041-A	
	Power amplifier assembly	AWH-030-0	
	Control amplifier assembly	AWG-027-0	
	Equalizer amplifier assembly	AWF-013-0	
	Protection circuit assembly	AWM-062-0	
	Power supply circuit assembly	AWR-056-0	
	Switch circuit assembly (function)	AWS-069-0	
	Switch circuit assembly (speakers)	AWS-064-0	
	Switch circuit assembly (mode, loudness)	AWS-065-0	
	Switch circuit assembly (filters)	AWS-066-0	
	Switch circuit assembly (tape monitor)	AWS-067-0	
	Switch circuit assembly (dimmer)	AWS-068-0	
	Lamp board assembly	AWX-069-0	
	5P connector assembly	AWX-062-0	
	Muting circuit assembly	AWM-063-0	
	Front panel assembly	ANB-260-B	
	Wooden cabinet assembly	AMM-035-B	
	Foot	AEC-027-B	
	Tuning shaft assembly	AXA-056-0	
	Tuning pulley assembly	AXA-015-A	
	Ferrite antenna holder assembly	AXB-001-B	
	Dial pointer assembly	AAF-031-A	
	Dial scale	AAG-074-A	
	Meter (Tuning and Signal)	AAW-029-0	
	Knob (Tuning)	AAA-026-A	
	Knob (Bass-main, Treble-main, Volume, Balance)	AAB-068-A	
	Knob (Bass-sub, Treble-sub)	AAB-069-B	
	Knob (Power, Tone, Duplicate, Monitor, 4-CH adaptor)	AAD-040-0	
	Knob (Speaker A, B, C)	AAD-064-A	
	Knob (Low cut, High cut, –20dB)	AAD-065-A	
	Knob (Function)	AAD-066-A	
	Knob (Mode, Loudness)	AAD-067-A	
	Coupler (knob-to-switch)	AAE-007-0	
	Knob (Dimmer, FM muting)	AAD-082-A	
	Phono jack-B (6 jacks)	AKB-017-0	
	Phono jack-A (4 jacks)	AKB-014-0	
	Phono jack (1 jack)	AKB-019-0	
	Antenna terminal board	AKA-002-0	
	Binding post for ground	AKE-012-A	
	Power transformer	ATT-180-A	

Symbol	Description	Part No.	
	Ferrite loopstick antenna	ATB-026-0	
	Balun	T22-025-A	
	Fuse 3.15A (protection)	AEK-042-0	
	Fuse 1A (protection)	E21-031-0	
	Pilot lamp 8V, 0.3A (dial scale)	E22-032-0	
	Pilot lamp 8V, 0.3A (meter)	AEL-015-0	
	Pilot lamp 8V, 50mA (program indicator)	AEL-022-0	
	Pilot lamp 8V, 50mA (program indicator)	AEL-024-0	
	Connector (AC power)	AKP-008-0	
	Speaker output terminal	AKE-014-0	
	Phone jack (Headphone)	K72-026-0	
	Phone jack (Microphone)	K72-024-0	
	Socket (power transistor)	AKH-001-0	
	Jumper plug	AKM-004-A	
	Pilot lamp socket	AKK-002-0	
	Fuse holder (protection)	K91-008-0	
	AC cord grommet	AEC-079-0	
	Spacer (insulator)	AEC-076-0	
	Screw M4 x 15	ABA-010-A	
	Operating instructions (English)	ARB-099-0	
	Operating instructions (French/German)	ARD-065-0	
	FM T-type antenna	ADH-002-0	
	Packing case	AHD-212-A	
	Side pad (L)	AHA-066-A	
	Side pad (R)	AHA-067-A	
	Inside packing	AHC-014-A	

14.2 POWER SUPPLY CIRCUIT ASSEMBLY (AWR-056-0)

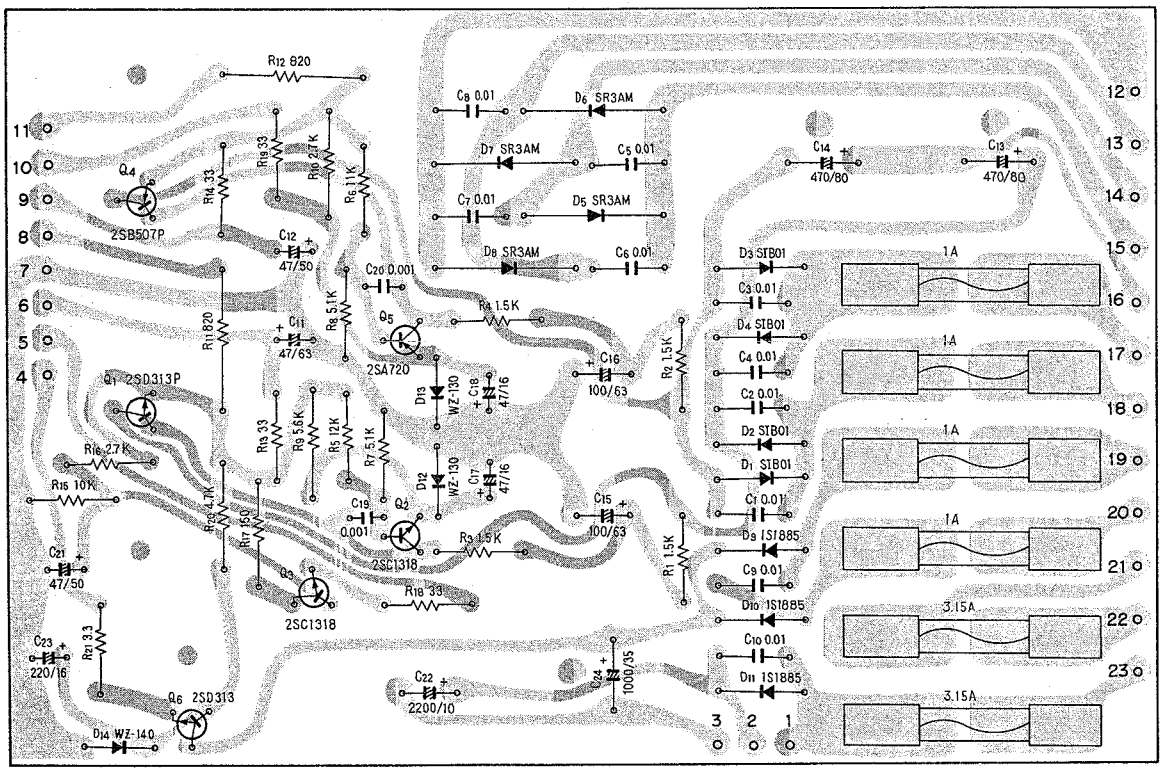


2SD313
2SD313P
2SB507P



2SA720
2SC1318

Foil Side



Parts List of Power Supply Circuit Assembly (AWR-056-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	150V	ACG-004-0	
C2	Ceramic	0.01	150V	ACG-004-0	
C3	Ceramic	0.01	150V	ACG-004-0	
C4	Ceramic	0.01	150V	ACG-004-0	
C5	Ceramic	0.01	150V	ACG-004-0	
C6	Ceramic	0.01	150V	ACG-004-0	
C7	Ceramic	0.01	150V	ACG-004-0	
C8	Ceramic	0.01	150V	ACG-004-0	
C9	Ceramic	0.01	150V	ACG-004-0	
C10	Ceramic	0.01	150V	ACG-004-0	
C11	Electrolytic	47	63V	CEA 470P 63	
C12	Electrolytic	47	50V	CEA 470P 50	
C13	Electrolytic	470	80V	ACH-038-0	
C14	Electrolytic	470	80V	ACH-038-0	
C15	Electrolytic	100	63V	CEA 101P 63	
C16	Electrolytic	100	63V	CEA 101P 63	
C17	Electrolytic	47	16V	CEA 470P 16	
C18	Electrolytic	47	16V	CEA 470P 16	
C19	Ceramic	0.001	50V	CKDYF 102Z 50	
C20	Ceramic	0.001	50V	CKDYF 102Z 50	
C21	Electrolytic	47	50V	CEA 470P 50	
C22	Electrolytic	2,200	10V	CEA 222P 10	
C23	Electrolytic	220	16V	CEA 221P 16	
C24	Electrolytic	1,000	35V	ACH-039-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	1.5k		RD¼PS 152J	
R2	Carbon film	1.5k		RD¼PS 152J	
R3	Carbon film	1.5k		RD¼PS 152J	
R4	Carbon film	1.5k		RD¼PS 152J	
R5	Carbon film	12k		RD¼PS 123J	
R6	Carbon film	11k		RD¼PS 113J	
R7	Carbon film	5.1k		RD¼PS 512J	
R8	Carbon film	5.1k		RD¼PS 512J	
R9	Carbon film	5.6k	½W	RD½PS 562J	
R10	Metal oxide	2.7k	1W	RS1P 272J	
R11	Metal oxide	820	2W	RS2P 821J	
R12	Metal oxide	820	2W	RS2P 821J	
R13	Carbon film	33		RD¼PS 330J	
R14	Carbon film	33		RD¼PS 330J	
R15	Carbon film	10k		RD¼PS 103J	
R16	Carbon film	2.7k		RD¼PS 272J	
R17	Carbon film	150	½W	RD½PS 151J	
R18	Carbon film	33		RD¼PS 330J	
R19	Carbon film	33		RD¼PS 330J	
R20	Carbon film	4.7k	½W	RD½PS 472J	
R21	Carbon film	3.3		RD¼PS 3R3J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SD313P-E or D		
Q2	Transistor	2SC1318-Q or R		
Q3	Transistor	2SC1318-Q or R		
Q4	Transistor	2SB507P-E or D		
Q5	Transistor	2SA720-Q or R		
Q6	Transistor	2SD313-E or D		
D1	Diode	SIB01-04		
D2	Diode	SIB01-04		
D3	Diode	SIB01-04		
D4	Diode	SIB01-04		
D5	Diode	SR3AM-8		
D6	Diode	SR3AM-8		
D7	Diode	SR3AM-8		
D8	Diode	SR3AM-8		
D9	Diode	1S1885 (SIB01-01)		
D10	Diode	1S1885 (SIB01-01)		
D11	Diode	1S1885 (SIB01-01)		
D12	Zener diode	WZ-130		
D13	Zener diode	WZ-130		
D14	Zener diode	WZ-140		

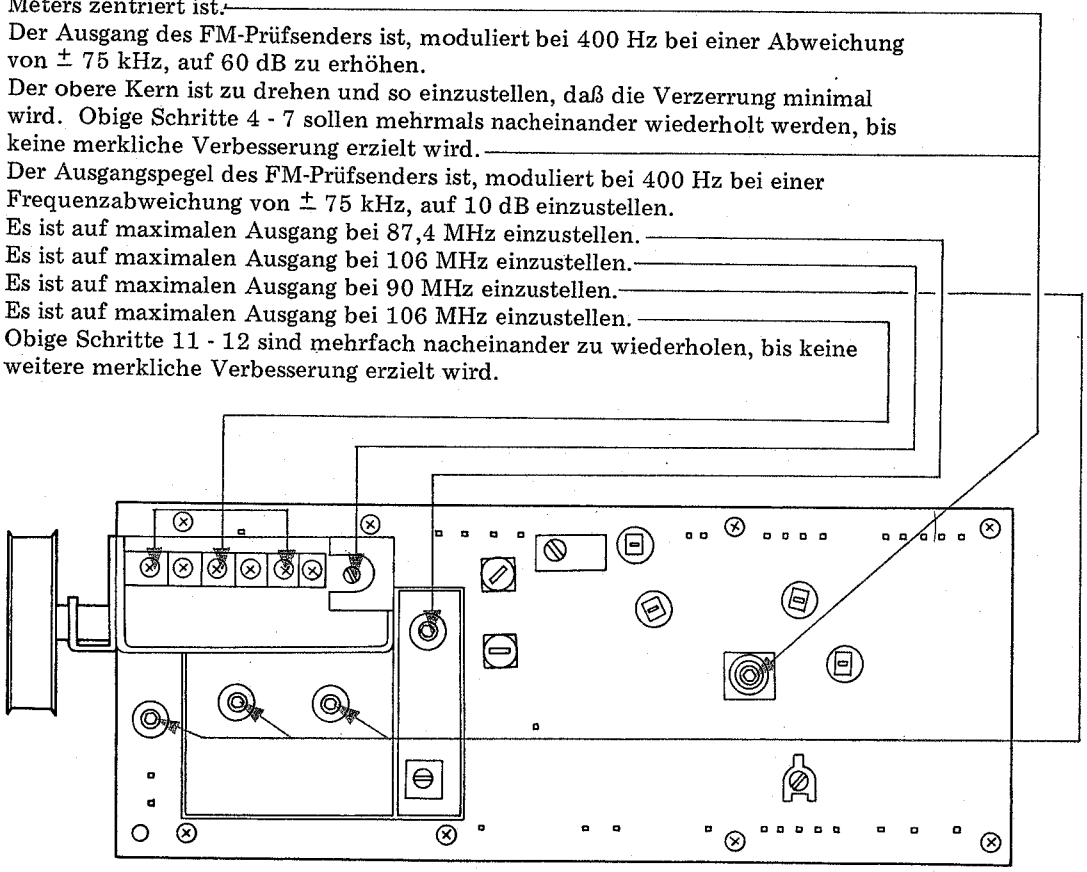
OTHERS

Symbol	Description	Part No.	
	Heat sink	ANH-117-0	
	Heat sink (small)	ANH-207-A	
	Socket (transistor)	AKH-002-0	
	Spacer (insulator)	AEC-043-0	
	Fuse holder	AKR-010-0	

10.2 ABGLEICHVERAHREN (GERMANY)

ABGLEICHEN DES FM-TEILS

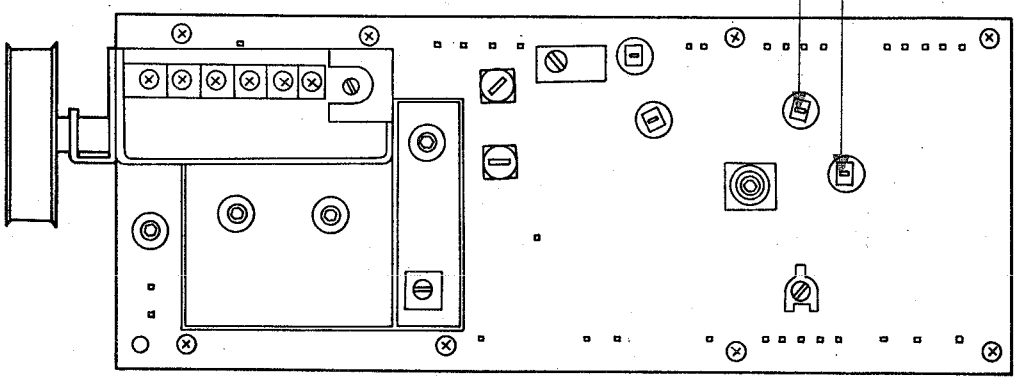
1. Regeleinstellungen am SX-939
   Die Steuerelemente (Knöpfe und Schalter) des SX-939 sind wie folgt einzustellen:
   POWER (Stromzuführung): ON (Ein)
   FUNCTION (Funktion): FM
   FM MUTING (FM-Dämpfung): OFF (Aus)
2. Schaltungen zwischen Prüfsatz und dem SX-939
   - Der Ausgang von einem FM-Prüfsender ist mit den 300-Ohm-Antennenanschlüssen des SX-939 zu verbinden.
   - Ein Klirrfaktormeßgerät ist mit den Anschlußbuchsen des SX-939 TAPE REC (Band-aufnahme) zu verbinden.
   - Ein Millivolt-Wechselspannungsmesser ist parallel zum Klirrfaktormeßgerät mit den Anschlußbuchsen TAPE REC (Band-aufnahme) des SX-939 zu verbinden.
3. Der FM-Prüfsender und der SX-939 sind beide auf eine Anzeige von 98 MHz einzustellen.
4. Der Ausgangspegel des FM-Prüfsenders ist auf minimale Einstellung herunterzudrehen.
5. Der untere Kern ist zu drehen und so einzustellen, daß die Nadel des Abstimm-Meters zentriert ist.
6. Der Ausgang des FM-Prüfsenders ist, moduliert bei 400 Hz bei einer Abweichung von ± 75 kHz, auf 60 dB zu erhöhen.
7. Der obere Kern ist zu drehen und so einzustellen, daß die Verzerrung minimal wird. Obige Schritte 4 - 7 sollen mehrmals nacheinander wiederholt werden, bis keine merkliche Verbesserung erzielt wird.
8. Der Ausgangspegel des FM-Prüfsenders ist, moduliert bei 400 Hz bei einer Frequenzabweichung von ± 75 kHz, auf 10 dB einzustellen.
9. Es ist auf maximalen Ausgang bei 87,4 MHz einzustellen.
10. Es ist auf maximalen Ausgang bei 106 MHz einzustellen.
11. Es ist auf maximalen Ausgang bei 90 MHz einzustellen.
12. Es ist auf maximalen Ausgang bei 106 MHz einzustellen.
    Obige Schritte 11 - 12 sind mehrfach nacheinander zu wiederholen, bis keine weitere merkliche Verbesserung erzielt wird.



ABGLEICHEN DES FM-MPX-TEILS

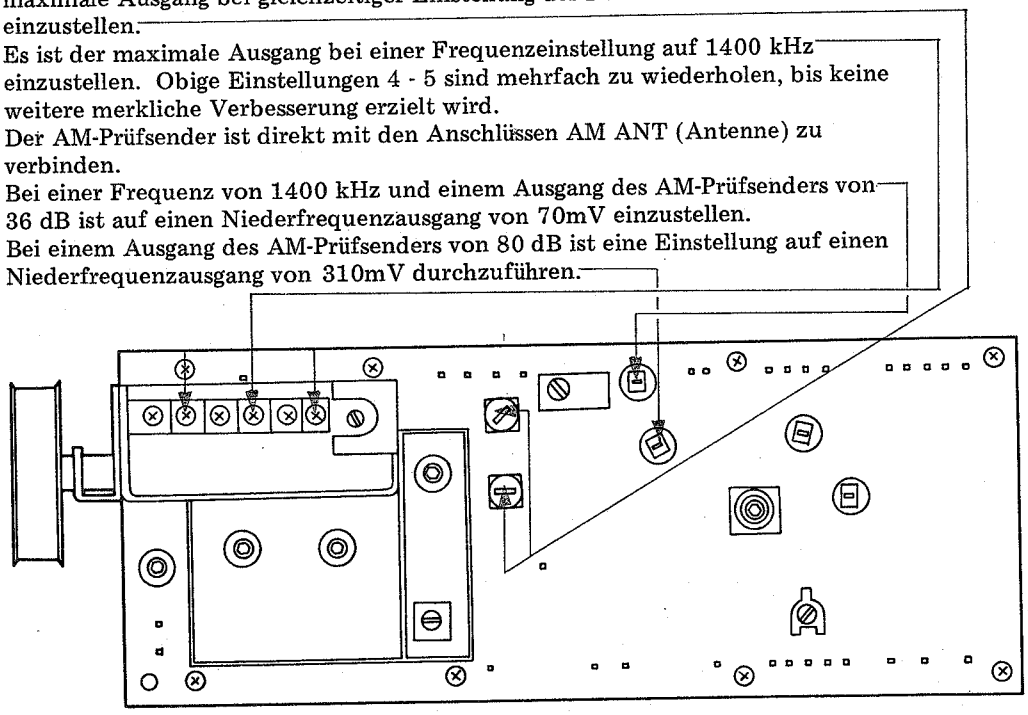
Zur Beachtung:
Die folgenden Einstellschritte sollten nicht vor Beendigung des Abgleichs des FM-Teils (siehe oben 1 - 12) durchgeführt werden. Der Multiplex-Prüfsender ist mit den Außenmodulatoranschlüssen des FM-Prüfsenders zu verbinden.

1. Regeleinstellungen am SX-939
   Die Steuerelemente (Knöpfe und Schalter) des SX-939 sind wie folgt einzustellen:
   POWER (Stromzuführung): ON (Ein)
   FUNCTION (Funktion): FM (UKW)
   FM MUTING (FM-Dämpfung): OFF (Aus)
2. Schaltungen zwischen Prüfsatz und dem SX-939
   - Der Ausgang vom FM-Prüfsender ist mit den 300-Ω-Antennenanschlüssen des SX-939 zu verbinden.
   - Der Ausgang vom MPX-Prüfsender ist an die Außenmodulatoranschlüsse des FM-Prüfsenders anzuschließen.
   - Die x-Anoden des Oszilloskops sind mit den Anschlüssen PILOT OUT am MPX-Prüfsender und die y-Anoden mit dem Anschluß 18 zu verbinden.
   - Der Millivolt-Wechselspannungsmesser ist mit den TAPE REC (Band-aufnahme)-Anschlüssen (mit Umschaltmöglichkeit von den Kanälen LH auf RH) zu verbinden.
3. Modulation des Multiplex-Prüfsenders
   L + R (1 kHz): Abweichung von 67,5 kHz
   PILOT (19 kHz): Abweichung von 7,5 kHz
4. Der Ausgang des FM-Prüfsenders ist auf minimales Niveau einzustellen.
5. Am Oszilloskop ist eine Einstellung auf eine stehende Wellenform der Lissajousschen Figur durchzuführen.
6. Der FM-Prüfsender ist auf einen Pegelausgang von 60 dB zurückzustellen und entweder der LH- oder der RH-Kanal zu modulieren.
7. Es ist auf maximale Trennung einzustellen.



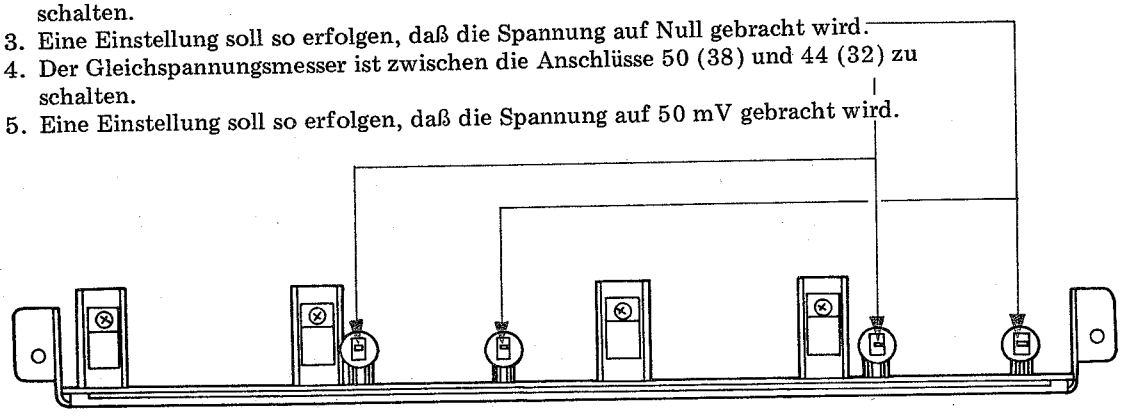
ABGLEICHEN DES AM-TEILS

1. Regeleinstellungen am SX-939
   Die Steuerelemente (Knöpfe und Schalter) des SX-939 sind wie folgt einzustellen:
   POWER (Stromzuführung): ON (Ein)
   FUNCTION (Funktion): AM
2. Schaltungen zwischen Prüfsatz und dem SX-939
   - Der AM-Prüfsender ist mit den AM-Antennenanschlüssen (in Reihenschaltung mit einem künstlichen Widerstand von 1 kΩ) zu verbinden.
   - Der Millivolt-Wechselspannungsmesser ist mit den Anschlußbuchsen TAPE REC (Band-aufnahme) zu verbinden.
3. Der AM-Prüfsender ist auf eine Modulation von 30 % bei 400 Hz einzustellen.
4. Der Ausgang des AM-Prüfsenders ist auf 30 dB bei 600 kHz einzustellen. Es ist der maximale Ausgang bei gleichzeitiger Einstellung des Ferritstabantennenkerns einzustellen.
5. Es ist der maximale Ausgang bei einer Frequenzeinstellung auf 1400 kHz einzustellen. Obige Einstellungen 4 - 5 sind mehrfach zu wiederholen, bis keine weitere merkliche Verbesserung erzielt wird.
6. Der AM-Prüfsender ist direkt mit den Anschlüssen AM ANT (Antenne) zu verbinden.
7. Bei einer Frequenz von 1400 kHz und einem Ausgang des AM-Prüfsenders von 36 dB ist auf einen Niederfrequenzausgang von 70mV einzustellen.
8. Bei einem Ausgang des AM-Prüfsenders von 80 dB ist eine Einstellung auf einen Niederfrequenzausgang von 310mV durchzuführen.

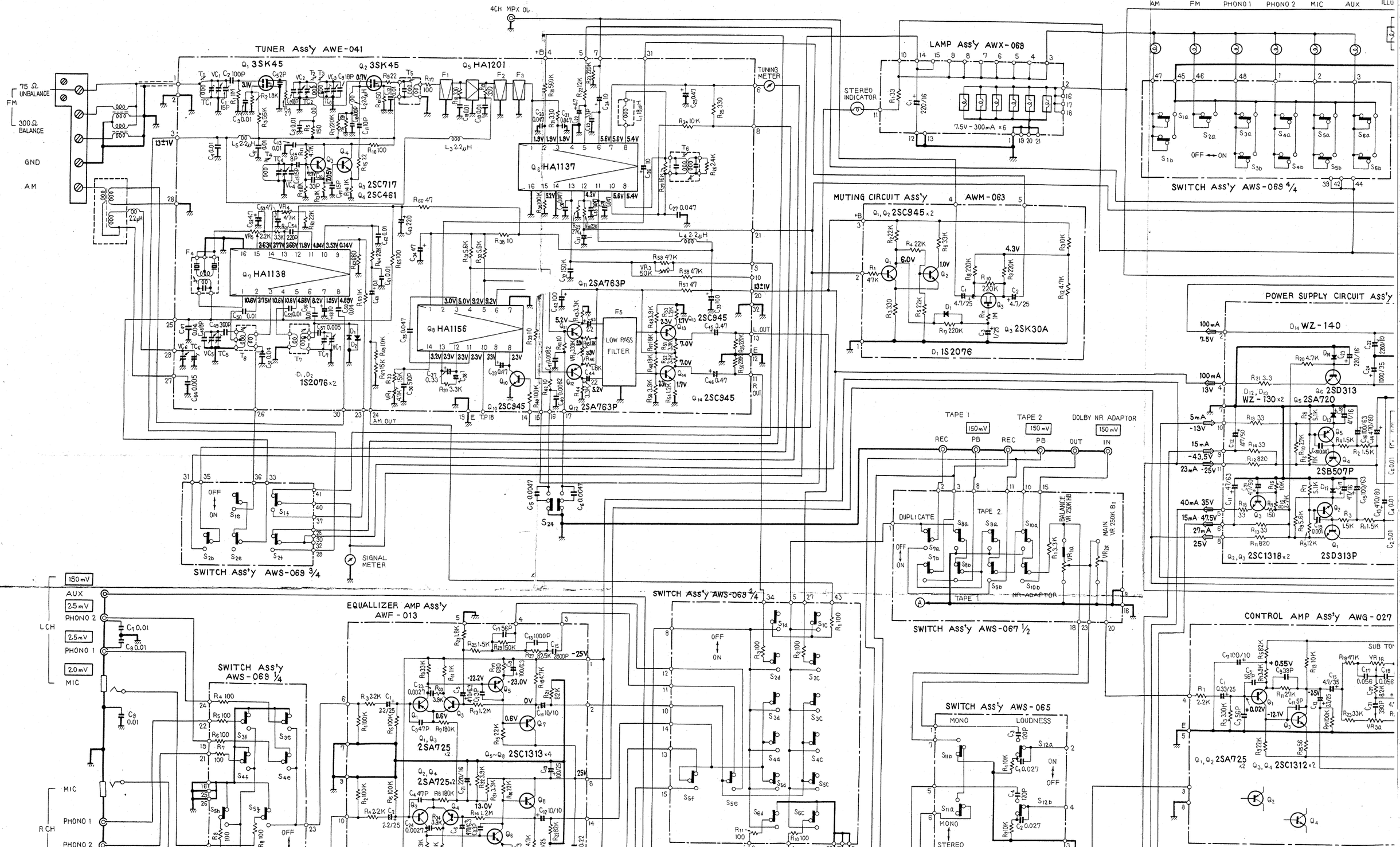


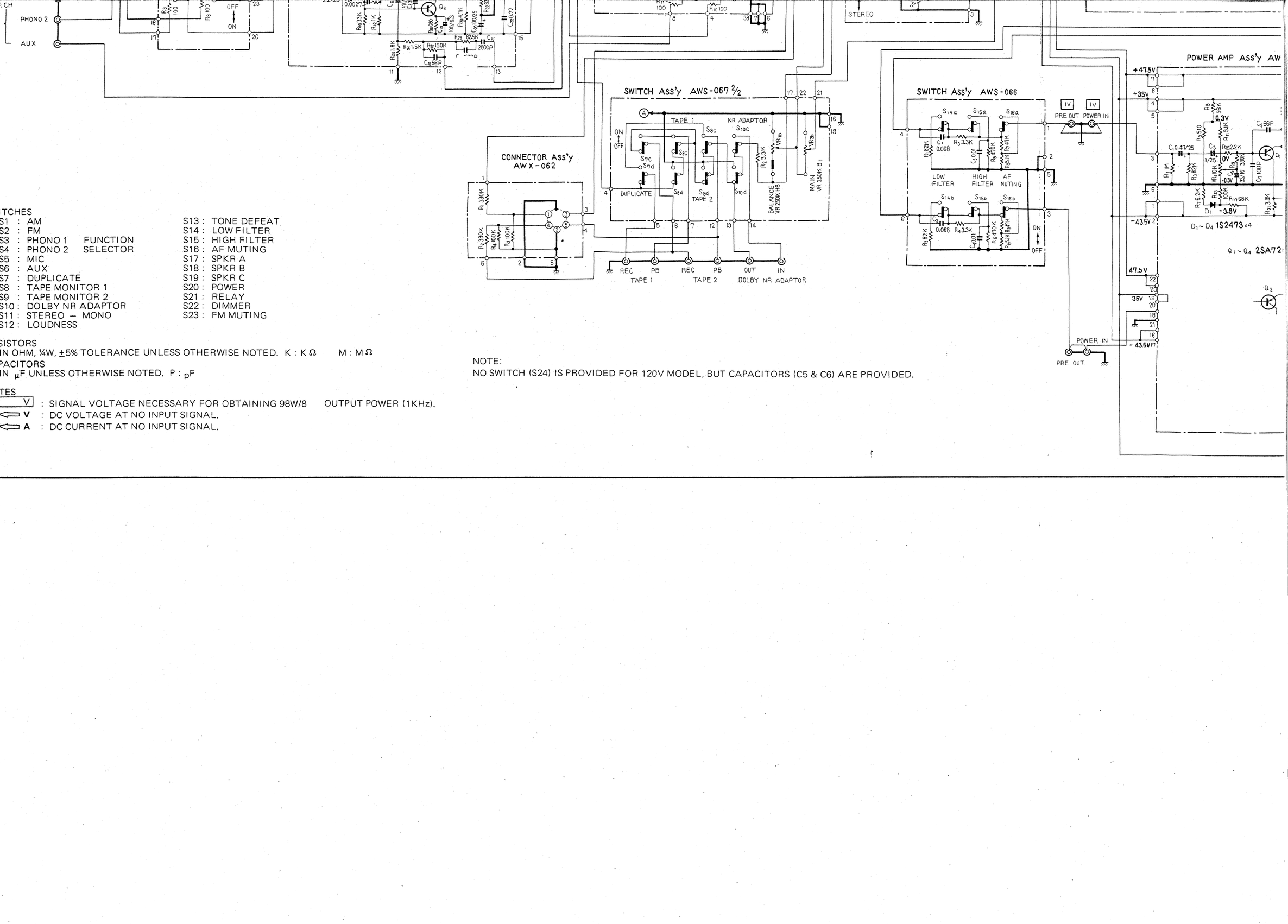
ABGLEICHEN DER ENDVERSTÄRKERSTUFE

1. Es ist nichts an die Eingangsbuchsen des SX-939 anzuschließen; ein künstlicher Widerstand von 8 Ω ist über die Lautsprecheranschlüsse anzulegen.
2. Ein Millivolt-Gleichspannungsmesser ist zwischen Anschluß 10 (25) und Erde zu schalten.
3. Eine Einstellung soll so erfolgen, daß die Spannung auf Null gebracht wird.
4. Der Gleichspannungsmesser ist zwischen die Anschlüsse 50 (38) und 44 (32) zu schalten.
5. Eine Einstellung soll so erfolgen, daß die Spannung auf 50 mV gebracht wird.



120V ONLY MODEL AND 5 LINE VOLTAGE MODEL





SWITCHES

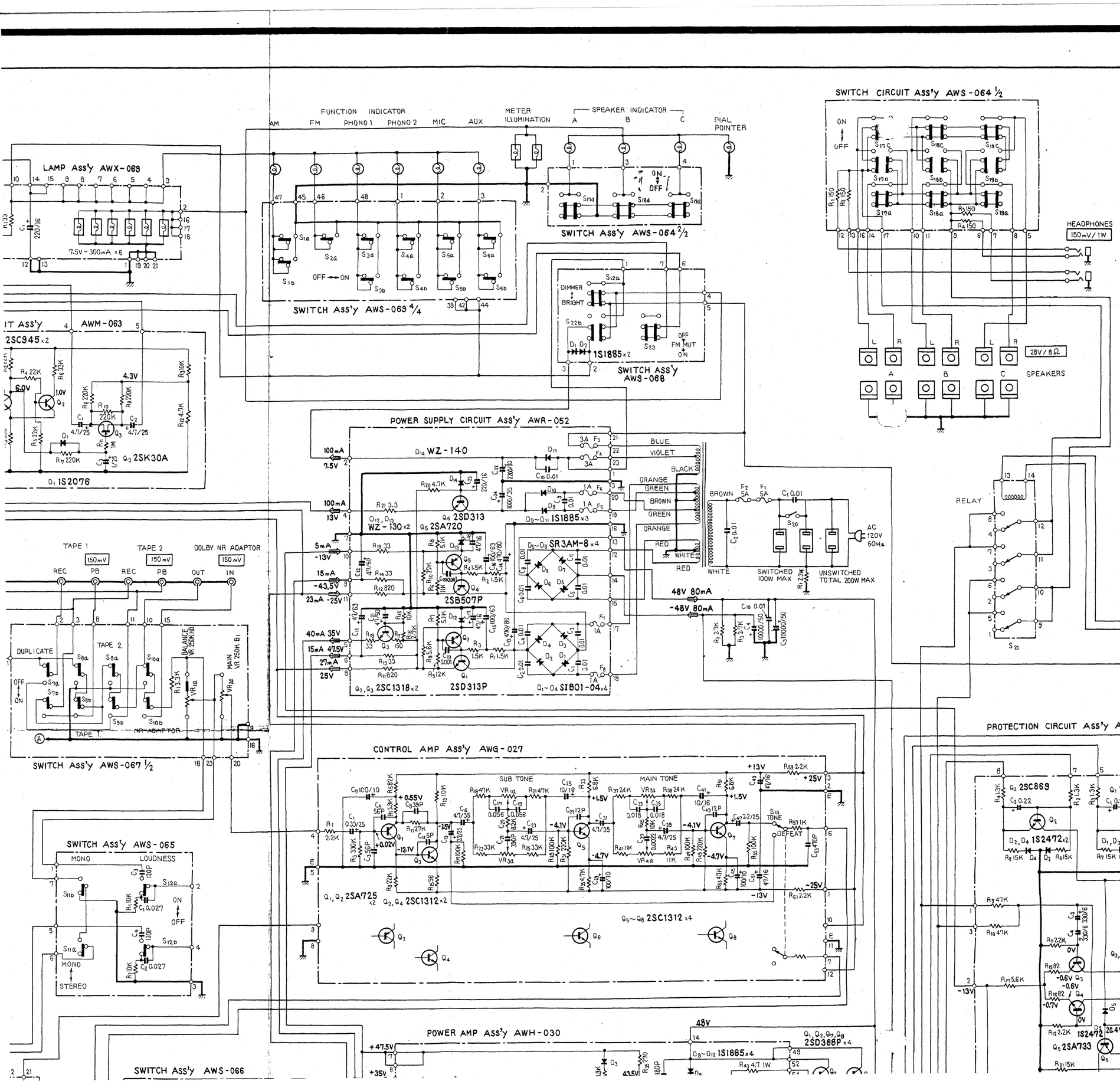
S1	: AM	S13	: TONE DEFEAT
S2	: FM	S14	: LOW FILTER
S3	: PHONO 1 FUNCTION	S15	: HIGH FILTER
S4	: PHONO 2 SELECTOR	S16	: AF MUTING
S5	: MIC	S17	: SPKR A
S6	: AUX	S18	: SPKR B
S7	: DUPLICATE	S19	: SPKR C
S8	: TAPE MONITOR 1	S20	: POWER
S9	: TAPE MONITOR 2	S21	: RELAY
S10	: DOLBY NR ADAPTOR	S22	: DIMMER
S11	: STEREO – MONO	S23	: FM MUTING
S12	: LOUDNESS		

RESISTORS
IN OHM, ¼W, ±5% TOLERANCE UNLESS OTHERWISE NOTED. K : KΩ M : MΩ

CAPACITORS
IN μF UNLESS OTHERWISE NOTED. P : pF

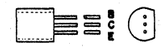
NOTES
[V] : SIGNAL VOLTAGE NECESSARY FOR OBTAINING 98W/8 OUTPUT POWER (1KHz).
⇦ **V** : DC VOLTAGE AT NO INPUT SIGNAL.
⇦ **A** : DC CURRENT AT NO INPUT SIGNAL.

NOTE:
NO SWITCH (S24) IS PROVIDED FOR 120V MODEL, BUT CAPACITORS (C5 & C6) ARE PROVIDED.

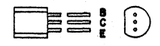


2SA720
2SC1318

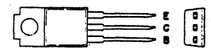
2SA725
2SA726S
2SC869
2SC1312
2SC1313



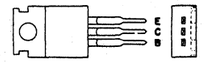
2SA733
2SA763P
2SC945



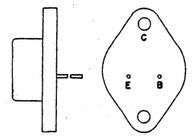
2SB527



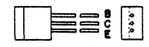
2SB536
2SB507P
2SD313
2SD313P
2SD381



2SB541P
2SD388P

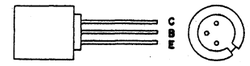


2SC461
2SC717

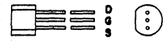


2SC1384

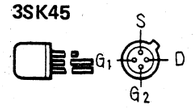
2SC1451



2SK30A



3SK45



HA1137

SWITCH ASS'y AWS-067 ½

SWITCH ASS'y AWS-065

SWITCH ASS'y AWS-066

CONTROL AMP ASS'y AWG-027

POWER AMP ASS'y AWH-030

PROTECTION CIRCUIT ASS'y AWM-062

POWER SUPPLY CIRCUIT FOR 5 LINE VOLTAGE MODEL

5 & C6) ARE PROVIDED.

2SC461
2SC717

2SC1384

2SC1451

2SK30A

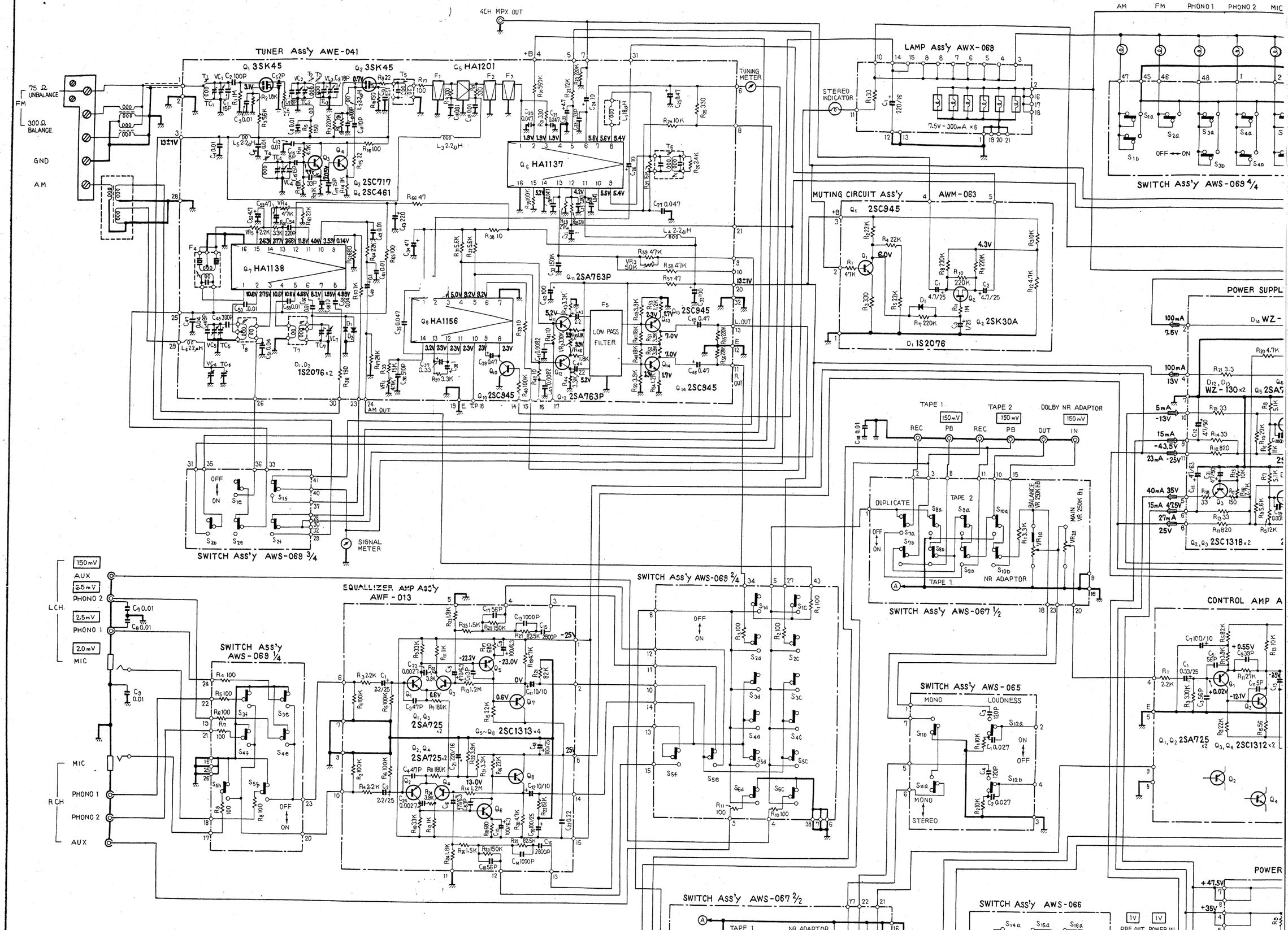
3SK45

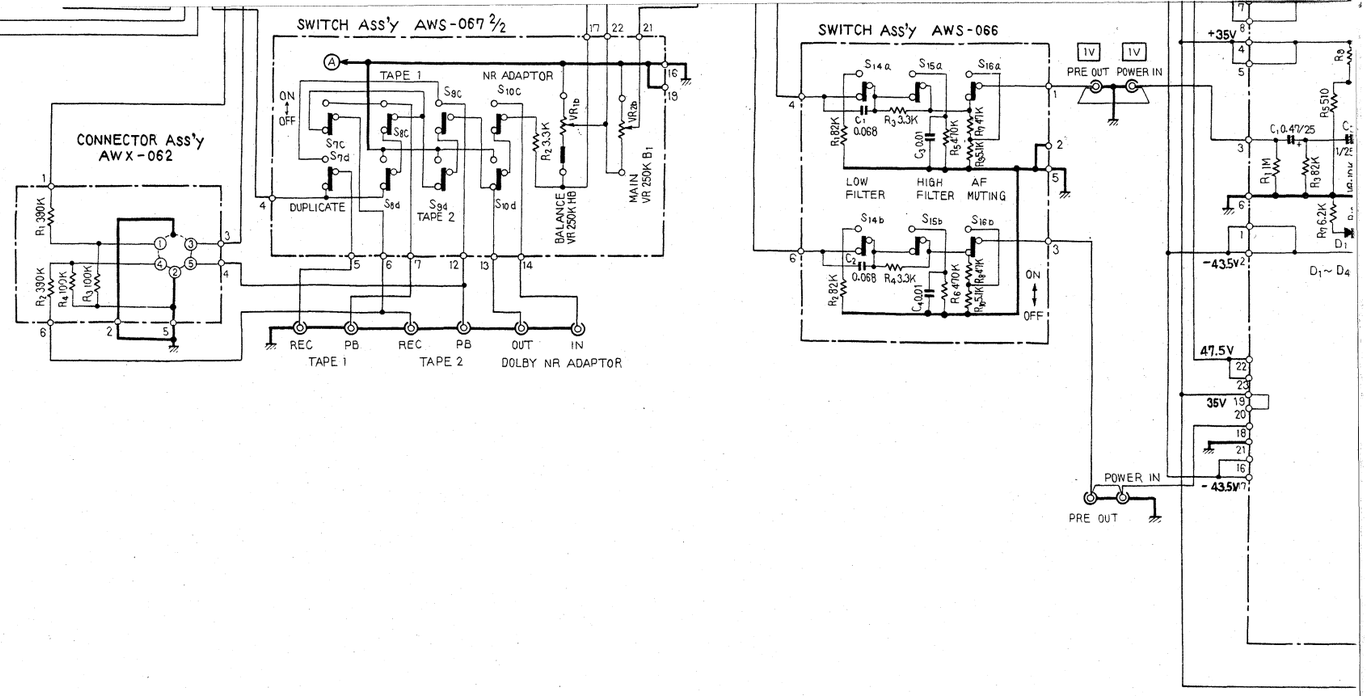
HA1137
HA1138

HA1156

HA1201

220V ONLY MODEL





SWITCHES

S1	: AM	S13	: TONE DEFEAT
S2	: FM	S14	: LOW FILTER
S3	: PHONO 1 FUNCTION	S15	: HIGH FILTER
S4	: PHONO 2 SELECTOR	S16	: AF MUTING
S5	: MIC	S17	: SPKR A
S6	: AUX	S18	: SPKR B
S7	: DUPLICATE	S19	: SPKR C
S8	: TAPE MONITOR 1	S20	: POWER
S9	: TAPE MONITOR 2	S21	: RELAY
S10	: DOLBY NR ADAPTOR	S22	: DIMMER
S11	: STEREO – MONO	S23	: FM MUTING
S12	: LOUDNESS		

RESISTORS
IN OHM, ¼W, ±5% TOLERANCE UNLESS OTHERWISE NOTED. K : KΩ M : MΩ

CAPACITORS
IN μF UNLESS OTHERWISE NOTED. P : pF

NOTES
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⇦ V : DC VOLTAGE AT NO INPUT SIGNAL.
⇦ A : DC CURRENT AT NO INPUT SIGNAL.

LAMP Ass'y AWX-069

STEREO INDICATOR

7.5V - 300mA ×6

FUNCTION INDICATOR: AM FM PHONO 1 PHONO 2 MIC AUX

METER ILLUMINATION

SPEAKER INDICATOR: A B C

DIAL POINTER

SWITCH Ass'y AWS-069 4/4

SWITCH Ass'y AWS-064 2/2

SWITCH Ass'y AWS-068

DIMMER BRIGHT

OFF FM MUT ON

SWITCH CIRCUIT Ass'y AWS-064 1/2

ON OFF

HEADPHONES 150mV/1W

28V/8Ω

A B C SPEAKERS

MUTING CIRCUIT Ass'y AWM-063

Q1 2SC945

Q2 2SK30A

D1 1S2076

4.3V

6.0V

POWER SUPPLY CIRCUIT Ass'y AWR-056

D14 WZ-140

D12, D13 WZ-130 ×2

Q6 2SD313

Q5 2SA720

2SB507P

Q2, Q3 2SC1318 ×2

2SD313P

D1~D4 SIB01-04 ×4

D5~D8 SR3AM-8 ×4

D9~D11 1S1885 ×3

100mA 7.5V

100mA 13V

5mA -13V

15mA -43.5V

23mA -25V

40mA 35V

15mA 47.5V

27mA 25V

3.15A F3

3.15A F4

1A F5

1A F6

1A F7

1A F8

BLUE VIOLET BLACK ORANGE GREEN BROWN GREEN ORANGE RED WHITE

RED WHITE

F1 3.15A

AC 220V 50/60Hz

S20

48V 80mA

-48V 80mA

RELAY

S21

TAPE 1 TAPE 2 DOLBY NR ADAPTOR

150mV

REC PB REC PB OUT IN

DUPLICATE

TAPE 2

BALANCE VR 250K1B

MAIN VR 250K B1

NR ADAPTOR

TAPE 1

SWITCH Ass'y AWS-067 1/2

SWITCH Ass'y AWS-065

MONO LOUDNESS

ON OFF

MONO STEREO

SWITCH Ass'y AWS-066

PRE OUT POWER IN

CONTROL AMP Ass'y AWG-027

SUB TONE MAIN TONE

+13V +25V -25V -13V

+0.55V +1.5V -4.1V -4.7V

Q1, Q2 2SA725 ×2

Q3, Q4 2SC1312 ×2

Q5~Q8 2SC1312 ×4

POWER AMP Ass'y AWH-030

+47.5V +35V

48V

Q1, Q2, Q7, Q8 2SD386P ×4

D9~D12 1S1885 ×4

43.5V 42.9V 1.2V

PROTECTION CIRCUIT Ass'y AWM-062

Q2 2SC869 Q1 2SC869

D2, D4 1S2472 ×2 D1, D3 1S2472 ×2

Q3, Q4 2SC945 ×2

D5~D7 1S2473 ×2

D8 1S2472

Q5 2SA733

20.4V 17.9V -1.0V 0V -0.6V -0.7V -13V

SWITCH Ass'y AWS-067 1/2

TAPE 1

TAPE 2

DUPLICATE

NR ADAPTOR

BALANCE VR 250K HB

MAIN VR 250K B1

SWITCH Ass'y AWS-065

MONO

LOUDNESS

STEREO

SWITCH Ass'y AWS-066

LOW FILTER

HIGH FILTER

AF MUTING

PRE OUT

POWER IN

DOLBY NR ADAPTOR

CONTROL AMP Ass'y AWG-027

SUB TONE

MAIN TONE

Q1, Q2 2SA725 x2

Q3, Q4 2SC1312 x2

Q5~Q8 2SC1312 x4

POWER AMP Ass'y AWH-030

Q1~Q4 2SA726S x4

D1~D4 1S2473 x4

D5, D6 STV4H x2

D7, D8 1S2473 x2

Q5, Q6 2SB527 x2

Q9, Q10 2SD381 x2

Q7, Q8 2SC1451 x2

Q11, Q12 2SB536 x2

Q1, Q2, Q7, Q8 2SD388P x4

D9~D12 1S1885 x4

Q3, Q4, Q5, Q6 2SB541P x4

PROTECTION CIRCUIT Ass'y AWH-062

Q1, Q2 2SC869

D1, D2, D3, D4 1S2472 x2

Q3, Q4 2SC945 x2

D5, D6, D7 1S2473 x2

Q5 2SA733

D8 1S2473

Q6 2SC945

Q7 2SC1384